

BREASTFEEDING, WEANING & NUTRITION: THE BEHAVIORAL ISSUES



BEHAVIORAL ISSUES IN CHILD SURVIVAL PROGRAMS:
Monograph Number Four

Prepared for
**THE OFFICE OF HEALTH
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT**

By Ann Brownlee, Ph.D.

Breastfeeding, Weaning and Nutrition: The Behavioral Issues
Monograph Number Four

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**Behavioral Issues in Child Survival Programs;
A Synthesis of the Literature with Recommendations for Project
Design & Implementation (six monograph series)**

*also available from: International Health and Development Associates. 18133 Coastline Drive, Suite 4A, Malibu, CA 90265

The impact of breastfeeding stretches across all child survival interventions. In addition to its direct impact on infants' health, it enhances each of the key child survival interventions -- diarrheal disease control, immunization, nutrition, and child spacing, -- and benefits maternal health as well. UNICEF recently estimated that one million infant lives could be saved every year in developing countries by promoting breastfeeding. This monograph on the behavioral aspects of breastfeeding, weaning and nutrition concentrates on several major issues, including: (1) beliefs, practices, and other important factors affecting feeding practices, nutrition and child survival; (2) health providers and institutions and their effects on feeding practices; (3) infant and child nutrition interventions both at the community level and in health institutions; (4) the critical and often neglected issue of sustaining and expanding nutrition programs; and (5) qualitative research methods useful for examining behavioral aspects of infant and child feeding. As each of these issues is explored, important questions concerning project design and implementation are first

outlined, significant findings are then reviewed, and finally recommendations and conclusions are presented for policy-makers and project and field personnel. This monograph is the fourth in the series which covers the behavioral issues of the following child survival interventions: Oral Rehydration Therapy; Immunization; Breastfeeding, Weaning and Nutrition; and, Growth Monitoring and Promotion. Monograph Five, Breastfeeding, Weaning and Nutrition: Expanded Bibliography, a companion to this monograph, presents a more comprehensive bibliography on behavioral factors related to breastfeeding, weaning and nutrition.

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INTERNATIONAL HEALTH & DEVELOPMENT ASSOCIATES

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PREFACE: OVERVIEW OF THE SERIES

This monograph is the fourth in the series **Behavioral Issues in Child Survival Programs: A Synthesis of the Literature with Recommendations for Project Design & Implementation**. The series covers the major child survival interventions with the exception of birth spacing. It thus includes the following: Oral Rehydration Therapy; Immunization; Breastfeeding, Weaning and Nutrition; and Growth Monitoring and Promotion.

This monograph, like others in the series, sets forth the major behavioral issues related to the intervention, summarizes research findings on each issue, presents recommendations, and includes a bibliography. The fifth publication, Breastfeeding, Weaning and Nutrition: Expanded Bibliography, a companion to this monograph, presents a more comprehensive bibliography on behavioral factors related to this subject.

Behavioral Factors in Child Survival

Success in child survival projects and programs depends not only on technical interventions themselves but on their being accepted and used by the millions of mothers and other child caretakers who determine in developing countries whether a child lives or dies. This requires that project designers and implementors understand not only the technical but also the behavioral factors that influence child survival in developing countries.

An enormous volume of research has been carried out during the 1980s on topics related to child survival. In addition to basic biomedical research, much of this has been qualitative research designed to provide answers on how to adapt technology, delivery systems, and promotional approaches to individual countries and cultures. Much of this research has been funded by the Agency for International Development (AID/Washington as well as by USAID bilateral projects). Additional research has been supported by UNICEF, WHO, and other organizations, public and private. Many social scientists have also conducted independent research that provides further valuable descriptive material about beliefs and practices of mothers and others that influence child survival.

The findings and conclusions of this large body of qualitative research can be extremely valuable for improving the design, implementation, impact, and sustainability of donor-funded projects and host-country programs.

These research results are not easily available, however, to either AID/Washington or mission personnel outside the countries where individual studies were initiated. Many of the studies have not been published. Some of the reports are still in rough form or in languages other than English. There is no central repository of

these studies. Nor, prior to this series, was there any comprehensive bibliography of research on behavioral aspects of child survival programs. It was for this reason that A.I.D.'s Office of Health initiated the "Behavioral Issues in Child Survival: Literature Review and Consultations Project" which produced this series of monographs and bibliographies.

Purpose and Audience of This Series

The immediate purpose of this series is to bring together the major findings, conclusions, and recommendations of this far-flung body of qualitative research on behavioral issues in child survival projects and programs. The ultimate purpose of this series is to help project and program personnel:

- o First, to understand better the behavioral factors that influence whether and how well parents and other child caretakers utilize child survival services; and
- o Second, to design and implement projects and programs that achieve higher levels of participation, more effective adoption of the new behaviors being promoted, and more sustainable impacts.

The monographs are to be used in AID/Washington, distributed to USAID missions, and made available to host-country counterparts, A.I.D. contractors, researchers, and others engaged in child survival activities.

Methodology

These monographs were prepared in two stages. First was the task of bringing together the published and unpublished literature. This was done by: interviewing and consulting with researchers and research sponsors in the U.S. and various developing countries; sending cables to all USAID missions and letters to researchers in other countries asking for relevant materials; conducting computerized and other searches of the published and unpublished reports; and, finally, acquiring copies of reports and publications that appeared germane. Computerized searches were performed by or accessed collections of the following organizations: A.I.D., UNICEF, Popline, the APHA Clearinghouse on Infant Feeding and Maternal Nutrition, Wellstart, and the International Development Research Centre (IDRC). The second stage was analysis and synthesis of the materials collected. The materials examined for the series include well over a thousand published and unpublished reports of research and studies conducted using qualitative, behavioral science methodologies.

Criteria for Selecting Materials Reviewed

In deciding what to include from the voluminous literature relating to behavioral aspects of child survival, the following criteria were adopted:

1. Child survival interventions: Concerning ORT and immunization, the goal was to be as comprehensive as possible. Concerning the area of nutrition improvement, on which an enormous amount of research has been conducted, it was decided to concentrate on two areas: (1) breastfeeding, weaning, and nutrition, with the greatest emphasis on breastfeeding; and (2) growth monitoring and promotion. Birth spacing was initially included in the series. Here, given the enormity of the family planning literature, the decision was made to focus on materials that explicitly discussed the use of family planning to increase birth intervals for purposes of maternal and child health. A copy of the initial report, Behavioral Aspects of Child Survival: Birth Spacing, by Soheir Sukkary-Stolba, is available from International Health and Development Associates.

2. Research methodologies: Research and studies included are those characterized as behavioral or behavioral science research, in contrast to biomedical research. Priority was placed on qualitative, as opposed to quantitative, studies. The dividing line is thin, however, as many quantitative studies (e.g. KAP surveys) seek to understand the same types of behavior as do the more clearly qualitative studies. **The goal was to seek studies that researched people's motivations and behavior in an in-depth manner;** some research on socio-economic characteristics has been included, but only when it appears to look in depth at related behavior. Priority was placed on project-related studies and studies of intervention-related behavior (in contrast to research focused more exclusively on traditional behavior--e.g., on mothers' knowledge of ORT as opposed to traditional means of treating childhood diarrhea).

Methodologies examined included those identified as:

- * ethnographic research,
- * anthropological research,
- * in-depth interviewing,
- * key-informant interviewing,
- * observation,
- * participant observation,
- * detailed activity studies,
- * focus group studies,
- * household studies,
- * community studies,
- * community diagnosis,
- * participatory research/evaluation,
- * social marketing research,
- * formative research,
- * motivational research,
- * practice studies,
- * audience research studies, and
- * action research.

Also included, especially when they attempted an in-depth examination of beneficiary behavior, were:

- * KAP (knowledge, attitudes and practice) studies,
- * baseline studies,
- * household surveys,
- * case studies,
- * situation analyses,
- * feasibility studies,
- * operations research,
- * pilot studies and surveys,
- * message testing and product preference trials, and
- * evaluation research based on longitudinal or other in-depth studies.

Project evaluations are also a rich source of information about behavior. Evaluations of the "rapid appraisal" type that are most commonly conducted on A.I.D. projects have generally not been included in this review, however, as they are the subject of other ongoing A.I.D.-sponsored activities (e.g., at Johns Hopkins University).

3. Behavior: Whose behavior is included? The focus is primarily on the behavior of mothers and other child caretakers, secondarily on service providers in relationship to the mothers and other child caretakers and, third, some organizational factors that directly affect mothers' behavior (e.g., hospital policies on rooming-in as they influence breastfeeding mothers). Other research on organizational behavior and systems has not been included (e.g., no research on management information systems, health care financing arrangements, or Ministry of Health re-organizations).

4. Research sponsor: Priority was given to studies funded by A.I.D., especially in A.I.D.'s 22 child-survival "target countries." Efforts were made to be as comprehensive as possible in finding studies funded by A.I.D. Unfortunately, some were undoubtedly still missed, given the fact that many USAID mission-funded studies never find their way back to Washington. (The same is true of UNICEF-funded field studies which likewise are not all available at headquarters.)

5. Time frame: A time frame of 1980-to-present was adopted at the time the initial draft report was completed in April 1988. Research conducted before 1980 but reported on after 1980 is also included. Some earlier exceptions have been included as judged important for the particular intervention. With a few exceptions, materials produced since April 1988 have not been included.

6. Other: A small number of more general items have also been included. Among these are: literature reviews, policy statements, topical overviews, and methodological materials.

General Conclusions and Recommendations

1. Further research should build on the findings and cumulative experience to date. Much has been learned during the last few years that can be applied to project design and implementation problems cross-nationally. Issues have been identified and general answers are available. The need is for project and program personnel to use these as a guide and point of departure (rather than reinventing the proverbial old wheel) and only then decide what precise questions remain on a country-specific basis.

2. The findings presented in this series should be further developed to assist A.I.D. personnel in designing and implementing more effective, sustainable projects. Other valuable information in the documents collected for this report but not presented here should also be utilized. Further work should focus on:

- o **Developing explicit procedural guidelines for project personnel to use in design, implementation, and evaluation.** Partial guidance is presented in this report, but recommendations need to be streamlined and more tightly linked to decisions in the project process. This was not possible within the scope of work for this activity.
- o **Synthesizing the lessons and recommendations about methodologies for learning about behavioral factors in child survival.** Mission personnel who are not behavioral scientists need to know, for example, what types of methodologies are appropriate for investigating priority issues, what research can easily be organized in-house, when to call in behavioral researchers, and what sort of guidance to give them. Again, far more has been written than is regularly being used by most USAID missions. Such information is contained or suggested throughout the literature collected for this project. This is a wealth of instructive information that should be summarized.
- o **Analysis of "cross-cutting topics."** Important cross-cutting variables (e.g., socioeconomic status, maternal education, and so on) affect acceptance and use of the child survival interventions. A synthesis of information on these cross-cutting variables can also assist project planning and implementation. These variables are discussed in each monograph as they relate to the particular intervention, but far more is included in the literature collected than could be included here.

About the Bibliographies

As noted above, a selective bibliography accompanies each monograph. For those interventions for which the behavioral literature is voluminous--namely oral rehydration therapy and breastfeeding, weaning, and nutrition--separate volumes, "expanded bibliographies," have been prepared. Copies of the key documents cited are held in the libraries of International Health and Development Associates.

Bibliographies are in Wordperfect 5.0 on floppy discs that could be shared with others. In some of the bibliographies an asterisk (*) is used to indicate work funded, partially or in full, by A.I.D. (although it has not been possible to identify all A.I.D.-funded reports). In both the Breastfeeding, Weaning and Nutrition and Growth Monitoring and Promotion bibliographies additional codes have been added at the end of certain citations. If the publication is available in a major collection or library (the AID/CDIE collection, APHA Clearinghouse in Infant Feeding and Maternal Nutrition, UNICEF, or Wellstart) this is noted in brackets, along with the document identification number, if available. In addition, the name of the country on which the publication focuses is inserted in brackets if it is not mentioned elsewhere in the citation, thus facilitating computer searches of the bibliographies by country.

Barbara Pillsbury,
International Health &
Development Associates

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Dr. Pamela Johnson of A.I.D.'s Office of Health, and Manager of A.I.D.'s Child Survival Program, is to be credited for initiating this activity and for her insight into the critical importance for project success of understanding the behavioral issues in child survival.

This series has been a mammoth undertaking. It would not have been possible without the interest and generous cooperation from professionals in many organizations: A.I.D., UNICEF, the World Health Organization, the Centers for Disease Control, the APHA Clearinghouse on Infant Feeding and Maternal Nutrition, Wellstart, the Academy for Educational Development, Management Sciences for Health, Manoff International, John Snow, Inc., Applied Communications Technology, Education Development Center, the Center for Population and Family Health at Columbia University, Water and Sanitation for Health, the International Science and Technology Institute, Johns Hopkins University, the Population Council, the Primary Health Care Operations Research Project, the Carolina Population Center, Pragma Corporation, and the International Development Research Centre. The authors are grateful for the interest shown by colleagues and others in these institutions as well as for the contributions and stimulating input from many individual researchers. Finally, the authors are grateful to Linda Vogel and Terry Gay of the Office of International Health, U.S. Department of Health and Human Services, and to Vivian Sellars of the LTS Corporation for their support of this project.

Acknowledgements for Assistance with this Monograph

I wish to thank the many people who contributed to this monograph. I would like to express my great appreciation to all the researchers and field personnel who shared their reports and field experiences with me. Many organizations, including Wellstart, the APHA Clearinghouse on Infant Feeding and Maternal Nutrition, and UNICEF, also gave generously of staff and computer time and supplied numerous documents which were critical to the analysis. I am grateful to all those who reviewed and commented on an earlier version of this report or supplied updated information on important developments in the fast changing field of breastfeeding, weaning and nutrition. I would especially like to thank Dr. Barbara Pillsbury, Dr. Beverly Winikoff, Dr. Sandra Huffman, Dr. Gayle Gibbons, Dr. Maryann Anderson, and Dr. Audrey Naylor.

Ann Brownlee,
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EXECUTIVE SUMMARY

Breastfeeding, Weaning & Nutrition - Its Role in Child Survival

One million infant lives could be saved every year in developing countries by promoting breastfeeding, according to a UNICEF estimate (Grant 1982). Studies indicate that on average the risk of death in infancy is five times higher for babies exclusively bottle-fed and three times higher for mixed-fed babies than for babies exclusively breast-fed (Grant 1984). Not only does breastfeeding provide infants with a perfectly balanced and digestible food sufficient for nutritional needs in the first few months of life, it also immunizes them with maternal antibodies, helping very effectively to fight off infection. In addition, breastfeeding acts as a natural birth spacer, providing an estimated 30 percent more protection against pregnancy than that provided by all organized family planning activities in developing countries (Kleinman 1984, Wellstart 1988).

As infants reach the age of five to six months they begin to need more food than mothers' milk can provide. This period is a particularly critical one for children in disadvantaged environments. Often the foods provided during the weaning process are insufficient, difficult to digest, or very low in nutritional value. Just when protection from maternal antibodies is becoming less effective, young children are exposed to a greater number of bacteria, viruses, and parasites. Continual infections and frequent diarrhea increase the possibility of undernutrition, making the weaning period a particularly precarious one for child survival.

Since the literature in the field of nutrition improvement is vast, the decision was made to focus this review on breastfeeding and weaning, the two aspects of nutrition improvement that have received the greatest amount of attention from behavioral scientists. The major emphasis is on breastfeeding, with a secondary emphasis on the critical period when supplements are first introduced. Growth monitoring and promotion are examined in a separate monograph as this more discrete and focused intervention raises its own particular set of issues and questions.

Issues covered in this review. This review of behavioral aspects of breastfeeding, weaning and nutrition concentrates on several major issues. First, beliefs, practices and other important factors affecting feeding practices, nutrition and child survival are examined. Then results from infant and child nutrition interventions both at the community level and in health institutions are reviewed. The critical and often neglected issue of sustaining and expanding nutrition programs is then discussed. Finally, qualitative research methods of particular value in examining behavioral aspects of infant and child feeding are presented.

As each of these issues is explored, important questions of project design and implementation are first outlined, significant findings are then reviewed, and finally recommendations and conclusions are presented.

Major Conclusions and Recommendations

Major conclusions and recommendations with implications for project design and implementation, emerging from the review of all the issues, are summarized below, so that busy administrators and field personnel can survey them first. The recommendations are highlighted in bold, for emphasis.

1. **Local beliefs and practices related to infant feeding.** Project planners should examine beliefs and practices related to infant feeding that may have an important effect on child health and survival. For example:

- o **Detrimental feeding practices.** The prevalence of feeding practices such as discarding colostrum, giving prelacteal feeds before the breastmilk "comes in", breastfeeding according to a schedule rather than on-demand, and avoiding night feeding should be explored, so educational strategies can be formulated when necessary. Colostrum is an extremely valuable substance for the newborn, with enhanced nutritional and protective qualities, and yet is discarded in many cultures. Practices such as rigidly scheduling feeding or curtailing nursing at night have been shown to lead to lower milk output and may contribute to the early cessation of breastfeeding.
- o **The importance of exclusive breastfeeding.** The extent to which exclusive breastfeeding is practiced should be examined, since **breastfeeding without supplementation during the first four to six months of life has been shown to substantially increase child health and survival rates in poor environments.** In much of the world mothers are surprisingly unaware of the benefits of exclusive breastfeeding and tend to begin feeding other substances at a very early age, even if breastfeeding continues. The protective antibodies and valuable nutrients in mothers' milk, as well as the decreased likelihood of contamination and infection when infants are breastfed exclusively, have been shown to increase by several fold a high-risk infant's chance of survival.
- o **Problems related to breastmilk substitutes.** Critical difficulties often associated with using breastmilk substitutes should be investigated, including the poor nutritional value of many of the substances offered and the tendency to dangerously over-dilute mixtures and use contaminated water and feeding containers during preparation. Substances given by bottle often contain little or no nutritional value and are many times dangerously contaminated. Over-dilution is common in low-income areas, leading to a significantly greater risk of severe malnutrition among bottlefed babies.

- o **Risks during the weaning period.** Project personnel should explore the nutritional content of traditional weaning foods. They should also investigate the extent to which practices such as introducing breastmilk substitutes very early or, at the other extreme, breastfeeding for an extended period without providing adequate supplementary foods, may be common in the local culture. Weaning foods are often very poor in nutritional content, contributing to a high risk of growth-faltering when sevrage takes place. The practice of weaning children dangerously early is common in many societies. In others children are traditionally weaned very late and mothers have little understanding of the importance of providing supplementary foods after infants are four to six months of age. In both cases malnutrition and mortality levels rise sharply.

2. Health workers and institutions. Health administrators working to improve infant feeding should explore health workers' knowledge of correct practices, as well as the prevalence of health institution procedures likely to adversely affect mothers' feeding behaviors. Health professionals in many countries are shockingly lacking in knowledge related to infant feeding and lactation management techniques. A wide range of common health institutional procedures have also been shown to be detrimental, and yet few clinics and hospitals have made recommended changes.

3. Other major factors affecting breastfeeding and child survival. Project planners should investigate the extent to which a variety of important factors significantly affect infant feeding behavior and thus child survival. For example:

- o **Social networks.** Project personnel should determine who within the mother's social network has greatest influence on her feeding practices, so key support groups can be targeted for nutrition education. Mothers, mothers-in-law, husbands, and friends may all play a role, but the extent of the influence of each tends to vary by culture.
- o **Urbanization and social change.** The often detrimental effects on infant feeding patterns of urbanization, migration and fragmented social systems should be explored so projects can identify groups at greatest risk. Urbanization usually results in lowered breastfeeding. Infants in migrating families and those living in societies with poor infrastructure and disrupted social systems are particularly vulnerable to malnutrition.
- o **Women's work.** The extent to which women's work is a major deterrent to exclusive or extended breastfeeding should be investigated further. Key factors influencing the effects of employment may include the type of work and its location, its compatibility with breastfeeding, and alternatives available for child care and feeding. Evidence suggests that although mothers who work tend to supplement more, work is clearly not the reason for most early supplementation.

- o **Income.** Project personnel should explore whether poor families using artificial milk have the resources to purchase enough of the often very high-priced substitutes to satisfy their infant's nutritional needs. Purchasing sufficient infant formula to adequately nourish an infant of two months may cost, in some countries, up to half or even three-quarters of a worker's monthly earnings. Thus artificial feeds are often over-diluted and given too infrequently, and nutritional status may abruptly decline when breastfeeding is abandoned.
- o **Sex-related biases.** Nutrition projects should determine whether there are substantial biases related to the sex of the infant, so that critically-disadvantaged groups can be considered for special care. Daughter neglect is a definite problem in some Asian cultures, for example, leading to significantly higher malnutrition among female infants and children.
- o **Maternal health and nutrition.** Nutrition projects should investigate whether problems of maternal health and nutrition are common in the local area and to what extent they affect infant feeding and care. It can then be determined whether interventions to supplement or encourage greater feed intake would be beneficial. Studies have shown that under non-starvation conditions women in developing countries can produce quantities of breastmilk comparable to those of women in developed countries, although enhancement of maternal nutrition may improve output to some degree.
- o **Promotion of breastmilk substitutes.** Infant formula promotion should be examined, since false and aggressive advertising and indiscriminant sample distribution may be deleterious to breastfeeding. Studies show, for example, that promotional activities may increase the probability of mixed feeding while infants are still very young and that infant food availability may shorten breastfeeding duration.

4. Interventions at the community level. Nutrition project designers should consider what types of nutrition strategies might best improve infant and child feeding and nutrition at the community level. For example:

- o **Development of community-based breastfeeding support groups.** The possibility of encouraging the development of support groups for breastfeeding mothers should be considered. In countries where these groups are active they have done impressive work in the area of providing mother-to-mother support, training breastfeeding counselors, initiating mass media campaigns, monitoring marketing of breastmilk substitutes, and exerting pressure for needed changes in legislation and hospital feeding practices.
- o **Promotion of better weaning practices and foods.** Initiatives to introduce new or improved weaning foods should be explored, with care taken to analyze tasks so that changes in food preparation proposed will be both possible and probable given time constraints, local preferences and the

availability of ingredients. If new weaning foods are being introduced, for example, it is important to determine what mothers must do to prepare them, whether the necessary ingredients, utensils and fuels are available, and whether recipes or mixtures are locally-acceptable.

- o **Control of breastmilk substitutes and adoption of stricter social legislation.** The feasibility of adopting and enforcing stricter breastmilk substitute codes and other legislation to improve infant feeding should be examined. Abuses by the infant formula companies are still widespread in many countries and stricter codes and more diligent monitoring may help. Initiatives to increase maternity leaves, require creches or nurseries at employment sites, and legislate nursing breaks may encourage longer breastfeeding among formally-employed women.

5. Interventions at the health institution level. Health administrators should determine what institutional strategies would best foster improved infant feeding practices and lower infection rates and mortality. For example:

- o **Training in lactation management.** Training of health institution personnel in lactation management should be included in all initiatives to promote major institutional changes that will increase child survival. Well-directed training activities have had an impressive impact on important procedures in graduates' own health institutions and resulted in a very useful "multiplier effect" in other organizations when those attending workshops are encouraged, in turn, to train others. It is important that teams being trained be multi-disciplinary, receive practical, action-oriented instruction, and be given systematic follow-up support when back on the job.
- o **Changes in institutional procedures.** Procedures associated with substantial improvements in breastfeeding practices, and thus with decreased infant morbidity and mortality, should be adopted by all health institutions. Changes shown to have positive effects on infant feeding and survival include, for example, eliminating unnecessary anesthesia during childbirth, discontinuing prelacteal feeds, encouraging early suckling and feeding on-demand, and instituting rooming-in arrangements.
- o **Control of infant formula.** Promotion and use of infant formula in hospitals, clinics and maternity centers should also be curtailed. Specific interventions to consider include banning the advertisement and distribution of formula company products and limiting use of breastmilk substitutes to cases where it is medically indicated.

6. Sustaining and institutionalizing changes. It is essential, early in the project planning stage, to consider how activities will be sustained when donor support ends, as well as what strategies are necessary to institutionalize important changes. Issues related to long-term viability are not seriously enough addressed in most projects. Early budgetary planning is essential, as well as

consideration of various strategies to institutionalizing important changes. Possibilities for integrating viable nutrition interventions with larger child survival or PHC initiatives should also be explored.

7. Expanding small-scale projects. When attempting to expand small-scale operations, project managers should consider carefully the behavioral, organizational and often political factors essential to success. Difficulties often encountered during the expansion phase indicate the importance of orienting activities toward results, developing good staff morale and systems for accountability, maintaining the ability to respond to special needs and situations, and encouraging continued community participation as operations grow larger.

INTRODUCTION

One million infant lives could be saved every year in developing countries by promoting breastfeeding, according to a recent UNICEF estimate (Grant 1982). In many of the poorer countries of the world, bottlefed children are five to ten times more likely to die before they reach the age of one than infants that are breastfed. Not only does breastfeeding provide infants with a perfectly balanced and digestible food sufficient for nutritional needs in the first few months of life, it also immunizes them with maternal antibodies, helping very effectively to fight off infection. In addition, breastfeeding acts as a natural birth spacer, providing an estimated 30 percent more protection against pregnancy than that provided by all organized family planning activities in developing countries (Kleinman 1984, Wellstart 1987).

As infants reach the age of four to six months they begin to need more food than mothers' milk can provide. This period is a particularly critical one for children in disadvantaged environments. Often the foods provided during the weaning process are insufficient, difficult to digest, or very low in nutritional value. Just when protection from maternal antibodies is becoming less effective, young children are exposed to a greater number of bacteria, viruses, and parasites. Continual infections and frequent diarrhea increase the possibility of undernutrition, making the weaning period a particularly precarious one for child survival.

Nutrition improvement in the Child Survival Strategy. The Agency for International Development's Child Survival strategy identifies the following infant and child interventions as important in improving nutrition: 1) breastfeeding, 2) weaning and introduction of solid foods, 3) feeding during diarrhea, 4) growth monitoring, 5) vitamin A supplementation, and 6) targeted supplementary feeding programs.

The focus of this review. Since the literature is vast, the decision was made to focus this review on breastfeeding and weaning, the two aspects of nutrition improvement that have received the greatest amount of attention from behavioral scientists. The major emphasis is on breastfeeding, with a secondary emphasis on the critical period when supplements are first introduced. Growth monitoring and promotion are examined in a separate monograph, as this more discrete and focused intervention raises its own particular set of issues and questions. Feeding during diarrhea is covered in the monograph on oral rehydration therapy. The areas of Vitamin A supplementation and targeted supplementary feeding programs are not discussed in this review. Despite numerous evaluations of P.L.-480 supplementary feeding programs, there has been relatively little qualitative research on behavioral aspects of these interventions.

Issues covered in this review. This review of behavioral aspects of breastfeeding, weaning and nutrition concentrates on several major issues. First, beliefs, practices and other important factors affecting feeding practices, nutrition and child survival are examined. Then results from infant and child nutrition interventions both at the community level and in health institutions are reviewed. The critical and often neglected issue of sustaining and expanding nutrition programs is then discussed. Finally, qualitative research methods of particular value in examining behavioral aspects of infant and child feeding are presented.

As each of these issues is explored, important questions of project design and implementation are first outlined, significant findings are then reviewed, and finally recommendations and conclusions are presented.

The collection and organization of documents. The literature collected on breastfeeding, weaning and nutrition is extensive. It includes published and unpublished papers, field project documents and agency reports. Many of the materials were unavailable before, except in particular countries or organizations. A selected bibliography containing all references cited is presented at the end of this review. The fifth publication in this series, Breastfeeding, Weaning and Nutrition: Expanded Bibliography, presents a more comprehensive bibliography on behavior factors related to this subject. Materials discussing the effects of lactation on amenorrhea are listed in this bibliography but were reviewed in the original report on birth spacing. Documents related primarily to feeding during diarrheal episodes are listed in the second publication in this series, Oral Rehydration Therapy: Expanded Bibliography.

The purpose of this review. This review was undertaken in order to bring together the major findings, conclusions and recommendations of this far-flung body of literature into a single monograph, with a format easy for both A.I.D. policy makers and field personnel to use. The bibliographies also serve as guides to the literature itself, with many of the major documents on behavioral aspects of breastfeeding, weaning and nutrition now available in one collection.

BEHAVIORAL ISSUES AND SIGNIFICANT FINDINGS

I. Local Beliefs and Practices Related to Infant and Child Feeding

Issues for Project Design and Implementation

What are the most important beliefs and practices within the local community concerning infant and child feeding, including, for example, those related to issues such as:

- o Choice of infant feeding method
- o Traditional beliefs concerning the physiology of breastfeeding
- o Colostrum and prelacteal feeds
- o Frequency, intensity and duration of suckling
- o Restrictions, taboos and special practices during breastfeeding
- o Using breastmilk substitutes
- o The weaning process
- o Terminating breastfeeding

How do various practices affect infant and child health and survival? Which practices should be reinforced and which targeted for change during nutrition intervention programs?

Choice of Infant Feeding Method

A WHO investigation of feeding practices around the world suggests that most countries seem to be progressing through three phases:

- 1) a "traditional phase" with a high prevalence and duration of breastfeeding,
- 2) a "transformation phase" where breastfeeding is falling and duration becoming shorter, and
- 3) a "resurgence phase" with a rising prevalence and duration of breastfeeding (WHO 1981a).

In many countries, however, the common pattern is less one of early total abandonment of breastfeeding, but rather a tendency to introduce other foods, especially various infant formulas and other substitutes in place of breastmilk, while

breastfeeding continues. Unnecessary early partial replacement of breastmilk with various substitutes introduces serious risks for the infant. One problem with the WHO typology is that it classifies countries purely on breastfeeding prevalence and duration and fails to consider the important issue of when substitutes are introduced (Latham et al. 1986:276).

Timing of the feeding decision. When women make the choice for breastfeeding, artificial feeding or a mixed approach varies by culture. Several studies suggest that choices are often made quite early, even before conception or in the first trimester of pregnancy (Small et al. 1985, Hally et al. 1984).

Reasons given for feeding choice. Reasons women give for choosing the bottle or a mixed-feeding approach over the breast are wide-ranging but there are many common themes. When questioned women may explain, for example, that their breastmilk is likely to be insufficient in quantity or quality, that infants must learn to drink from a bottle early on or they'll have trouble learning later, that bottlefed babies are fatter and thus healthier, that breastfeeding ruins their figures or breasts, that bottlefeeding is more modern, more convenient, or provides them greater freedom...(Booth 1985, Thorton 1984, Koh 1981). While partial understanding of the dynamics at work can be gained by asking women themselves, a study of other factors actually associated with various feeding choices provides an essential additional perspective, which will be explored in the third section of this monograph.

Traditional Beliefs Concerning the Physiology of Breastfeeding

Little has been written about folk perceptions of breastmilk. Many investigators assume that the traditional "physiology of breastfeeding" is similar to that of modern science. This is not always so:

- o In **Haiti**, for example, certain groups believe that breastmilk is spread out over a woman's body in much the same fashion as her blood. The points around the woman's nipples are seen as the terminal points for seven branches leading from various parts of her body, which draw the milk down after childbirth. Breastmilk is highly prone to displacement, and precautions must be taken to prevent it mixing with bad blood or working its way up to the woman's head. There are numerous methods for inducing lactation, it often being thought that if a woman's milk refuses to come, one of the branches may be at fault (Alvarez and Murray 1981:42).
- o The Bambara of **West Africa** believe that breastmilk is produced from "the blood" and that each person has a finite amount of blood for her lifetime. Therefore, additional blood cannot be produced and the quantity of milk cannot be affected through diet or medications. If blood is lost in an accident a woman may not be able to produce sufficient milk and may have to supplement with formula. Older women who have nursed many children may have a poor milk supply because they have "used up" all of their blood. The belief affects

attitudes about nursing other women's children, as children are thought to be related to their mother through her blood and thus through her breastmilk. Two children who have been breastfed by the same women cannot marry whether they are biologically related or not. The belief also affects weaning practices. Some women believe that once milk is produced from blood it should be used quickly or it will turn bad. Thus if a child has not asked for the breast for several days and then wishes to resume nursing, he will not be allowed to breastfeed again (Dettwyler 1987a:638).

Colostrum and Prelacteal Feeds

The benefits of colostrum and dangers of prelacteal feeds. Colostrum, the yellowish substance produced in the breasts before the milk comes in two to three days later, has been shown to have extensive medical and nutritional benefits for the newborn. Yet, in many cultures, it is discarded. The practice of giving prelacteal feeds, or offering newborns various substances before breastfeeding is initiated, on the other hand, is unnecessary and can be dangerous. It both exposes the newly born infant to risk of contamination and diverts mother and child from breastfeeding immediately after delivery, when the suckling reflex is enhanced. Prelacteal feeds are still quite common, both traditionally and in the institutional setting.

Beliefs and practices related to colostrum. There are wide variations in when breastfeeding is initiated and whether colostrum is fed to the newborn. A study of ethnographic data on breastfeeding in 81 societies found that in 52 percent of them delaying nursing 24 hours or more was common (Lozoff 1983). In **Mali** among the Bambara, women breastfeed on demand from birth (Dettwyler 1987a) and in the **Kingdom of Tonga**, 97 percent of women surveyed breastfed the first day (Jansen 1982). In groups surveyed in the **Philippines** and **Yemen Arab Republic**, however, less than half begin nursing the first day, but a majority start by the second or third (Fernandez and Popkin 1987, Beckerleg 1984). In certain parts of **India** and **Indonesia** colostrum is routinely discarded and nursing usually not initiated until the third day (Mantra et al. 1985, Dattal et al. 1984).

Many surveys report the percentage of mothers discarding colostrum with little explanation except that some respondents say it is "dirty", "yellow and therefore not real milk", and thus not fit for the baby to consume (Devi and Behara 1980, Hoodfar 1986, Mantra et al. 1985, Dattal et al. 1984). A few detailed ethnographic studies explored the issue in more depth and discovered wide variations and some fascinating reasons for discarding colostrum:

- o In **Papua New Guinea**, for instance, women in the town of Usino consider colostrum to be contaminated -- some saying it will poison the child because it is associated with pregnancy. Some believe it is the milk that remained when the mother weaned her previous child and resumed sexual relations. "All women agree that semen entering the milk turns it yellow or black and such milk will sicken a nursing child." Breastfeeding usually commences the morning after

birth, suggesting that the local definition of colostrum differs from that of other groups that believe the true milk doesn't come in until the third day (Conton 1995:44).

- o Women attending focus group sessions in **India** reported a reluctance to feed colostrum for a range of reasons. Women suggested that it "spoils the child's health...is difficult to digest...is milk stored for 9 months and thus spoilt... makes the child's stomach get bigger..." (MODE 1986). However, this study and work using similar small group discussions in **Indonesia** indicates that resistance is not high and may be relatively easy to change (Mantra et al. 1985).
- o A detailed study in a **Haitian** village found a recent negative shift in local attitudes toward colostrum. Eight years earlier opinion was unanimous that colostrum was very nutritious and something to which a newborn had a right. The most recent investigation indicates a growing ambiguity, apparently because of increased contact with lower level health workers in the capital who consider colostrum undesirable (Alvarez and Murray, 1981).

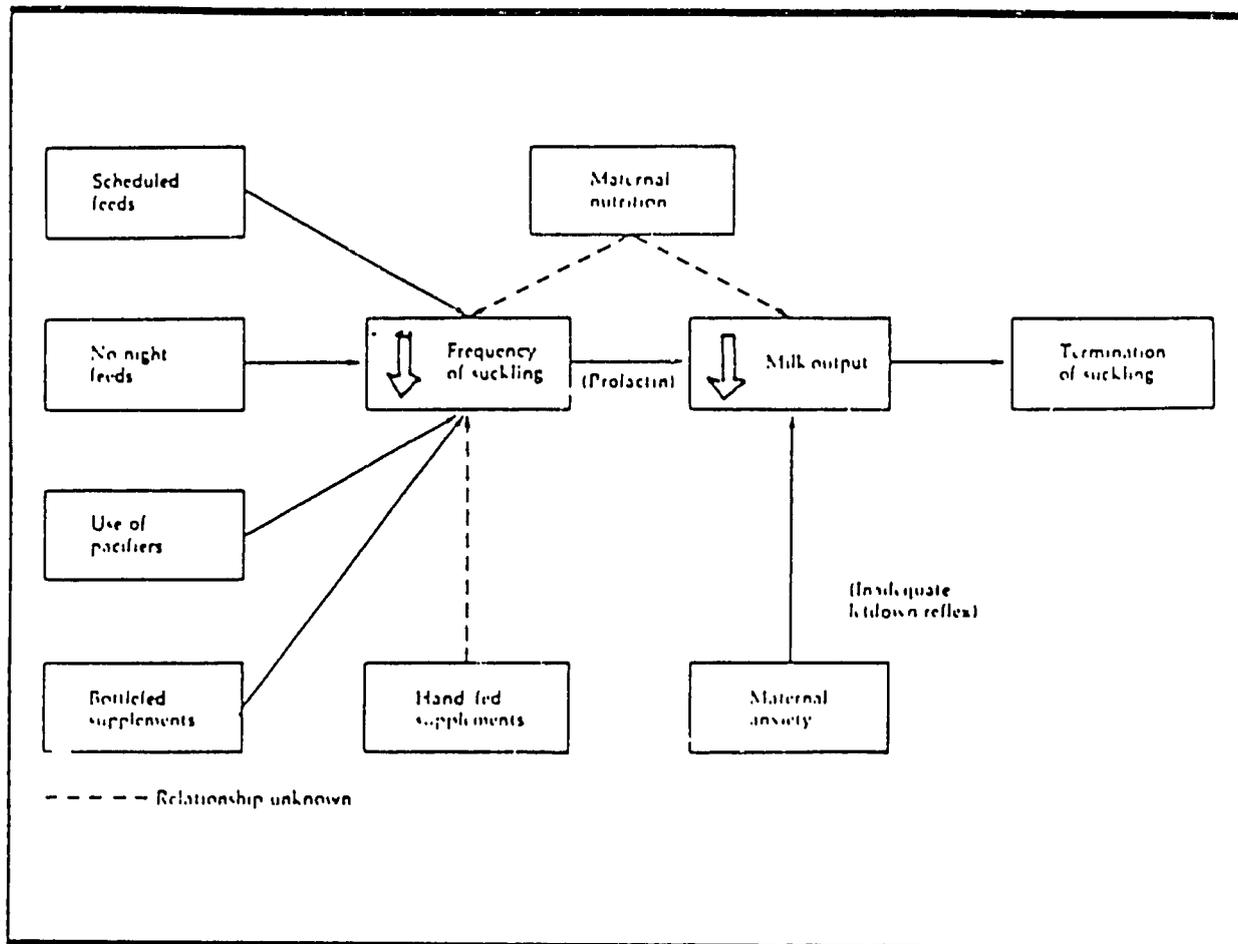
Common prelacteal feeds. Prelacteal feeds, as mentioned earlier, appear to be common in many societies. In Himachal Pradesh, **India**, honey, jaggery (a brown sugar made from palm sap), cow milk or glucose water is given to tide children over the period of starvation until "lactation begins." This feeding is done sometimes by means of an unsterilized coin, spoon or cotton wick (Dattal et al. 1984). In the **Haitian** village mentioned earlier a homemade purgative is traditionally the first food fed to the newborn, in order to expel the meconium which is viewed as a "harmful black bulk which blocks the child's intestines" (Alvarez and Murray 1981:38). A study of prelacteal feeding in the **Philippines** determined that feeding of non-milk substances such as sugar water, various teas, and rice water was the dominant pattern the first day. Many infant feeding studies, by concentrating on the balance of breastmilk, commercially-prepared breastmilk substitutes, and combinations of both, ignore the widespread practice of feeding non-milk substances to the newborn (Fernandez and Popkin 1987).

Frequency, Intensity and Duration of Suckling

Once lactation is initiated, the patterns of breastfeeding in turn influence the frequency, intensity and duration of suckling. Thus breastfeeding patterns have a critical effect on the success and duration of lactation.

The physiology of suckling. When the infant sucks at the breast, prolactin and oxytocin are released within the mother's body. Prolactin is the hormone critical to milk production. It also is associated with the maintenance of amenorrhea. Oxytocin is the hormone necessary for milk ejection from the breast--triggering the "let-down reflex." Figure 1 on the following page, from Sandra Huffman's excellent article on the "Determinants of Breastfeeding in Developing Countries" (1984), outlines clearly and succinctly the factors that can decrease the frequency of suckling and eventually

Figure 1: Factors that decrease the frequency of suckling



(Huffman 1984)

lead to termination of breastfeeding. Breastfeeding also has important benefits for the mother, as the oxytocin assists in uterine contraction postpartum and helps to prevent often fatal maternal hemorrhage.

Practices detrimental to lactation. As the model aptly illustrates, a number of maternal practices or behaviors related to breastfeeding can have detrimental effects on lactation. Use of bottles and other supplements will be discussed later, but important breastfeeding practices will be examined now.

The practice of scheduling feeds rather than feeding on demand leads to decreased suckling and lowered milk output. Many traditional societies practice feeding on demand. Certain urban and higher class women have adopted more rigid feeding practices, in some cases because of advice from health professionals, in other cases because of a desire to emulate supposedly western practices or because of believed convenience. A study of three groups in **Egypt**, for example, found that almost all traditional rural and urban poor mothers practiced feeding-on-demand, while regulated feeding was practiced by 55 percent of the urban elite group (El Mougi et al. 1981).

Night feeding is also common in many traditional cultures. The infant often sleeps in the same bed with the mother up to a certain age, and may suckle while the mother sleeps. Most experts suggest that this practice should be encouraged, as it helps maintain milk production and may lengthen postpartum amenorrhea.

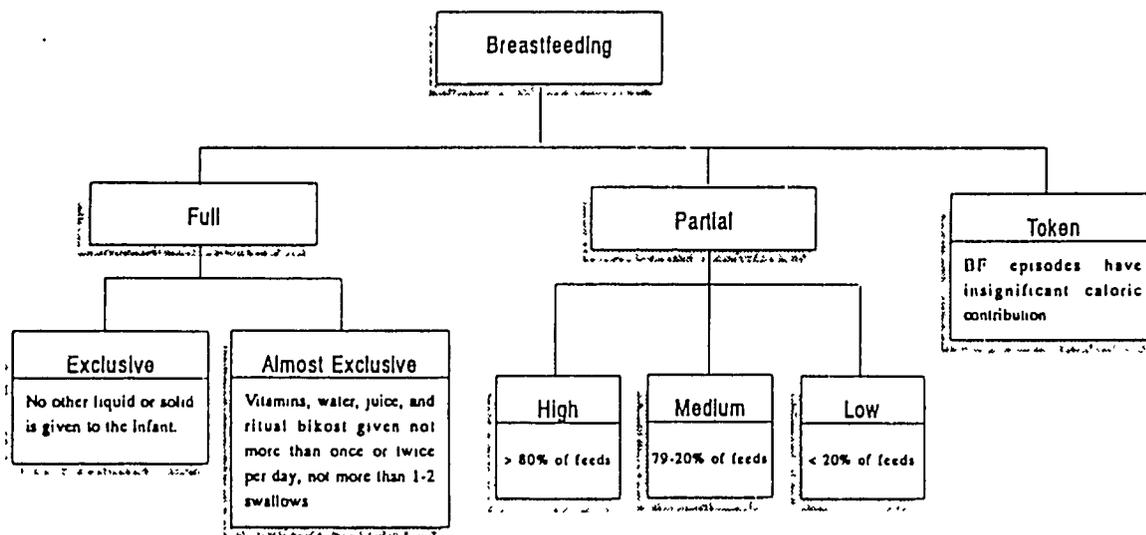
The value of exclusive breastfeeding. Exclusive breastfeeding has widespread benefits during the first few months of life. It provides the infant with the maximum amount of mother's milk, with all its nutrients and protective substances, and also guards the very young infant from contaminants usually introduced via supplementation.

The importance of exclusive breastfeeding does not appear to be understood in much of the world, however. The pervasiveness of practices such as providing prelacteal feeds and supplementing breastmilk with a wide variety of other liquids and semi-solids at an early age suggest that exclusive breastfeeding may not be common. Research studies often neglect to determine whether infants are being breastfed exclusively or not. Investigators may lump into the "breastfeeding" category such varied practices as breastfeeding exclusively, breastfeeding with occasional or regular supplementation of water, formula or other liquids, and breastfeeding just minimally with most sustenance provided by substitutes. If a goal is to determine how practices may need to be changed to enhance lactation and protection from infection, focus on the extent of exclusive breastfeeding is very important.

A meeting was held recently by the Interagency Group for Action on Breastfeeding to develop and agree upon a consistent set of definitions of breastfeeding behaviors in order to facilitate the collection of valid and reliable information upon which to base appropriately informed policy. Representatives from a number of key organizations involved in breastfeeding programs and research at an international level developed a common set of definitions which used biological

dynamics as a basis for categorization, was able to adequately differentiate between "full" and "partial" breastfeeding and was appropriate for the collection of cross-sectional data. The basic schema is presented in Figure 2. Additional information can be found in the meeting report (Labbok & Krasovec 1988).

Figure 2: Schema for breastfeeding definition



(Labbok & Kasovec 1988:17)

Restrictions, Taboos and Special Practices During Breastfeeding

Dietary Restrictions. In a great number of cultures there are dietary restrictions during the breastfeeding period. The concept of "hot and cold" foods (which refers to the intrinsic nature of the foods, rather than their temperature) has been documented in at least 34 countries. Vulnerable groups, such as the young, and pregnant, postpartum and lactating mothers are most affected by the hot/cold ideology (Nichter and Nichter 1981). In many Asian cultures lactating mothers and those who have recently given birth are cautioned in particular to avoid cold foods, as women are *yin* in nature and felt to be suffering from lack of hotness or fire (Pillsbury 1978:13 and 15, Koh 1981:88). In many parts of Oceania certain food restrictions are based on the belief that "through breastmilk the child will acquire the negative characteristics of the food in its natural state. For instance, to eat crocodile or fish that

have scales will give ringworm to the infant. To eat wallaby will give the child crooked legs and its ability to stand will be impaired" (Conton 1985:48). In **Nepal**, lactating mothers in some regions do not include leafy vegetables, fruits and soybean in their diets until two months after delivery, as it is believed that these foods cause gastrointestinal troubles and colds (Gujral and Rajbhandari 1981).

Recommended Foods. On the other hand there are often recommended foods as well. Among the groups in **Nepal** mentioned above, consumption of milk and meat is quite generous until two months after delivery, when it is then curtailed (Gujral and Rajbhandari 1981). In **Tanzania** customs among certain ethnic groups, demand that the mother be fattened for the first three months after giving birth and the husband, by tribal law, must buy special foods for his lactating wife (Kimati 1986).

Other restrictions and taboos. There are also various non-dietary restrictions and taboos in many societies. In the **Yemen Arab Republic**, for example, it is believed that the heat from the tanur, the clay oven used for baking bread, is harmful to breastmilk, making it like water (Beckerleg 1984). In a number of societies, strong emotions, especially those involving anger, are seen as harmful. Emotional stability is seen as particularly important if breastfeeding is to be continued (Alvarez and Murray 1981, Scheper-Hughes 1984)

Prohibitions against sexual intercourse. Abstinence from sexual intercourse while breastfeeding is a common restriction in some traditional cultures. In a study in two local maternity centers in Ile-Ife, **Nigeria**, 88.3 percent of the mothers regarded sexual intercourse during the entire lactation period as taboo, primarily "for fear that the infant might suck the father's sperm in the breast" which could eventually cause diarrhea (Ojofeitimi 1981b). Often the practice of polygamy makes it possible for the husband to continue to satisfy his sexual needs during this long period without going outside the family. Ojofeitimi suggests that although polygamy is becoming less common, women in this area still strongly adhere to the taboo. Among Igbo mothers in **Nigeria**, however, the practice is apparently no longer strictly observed, even in the rural areas (Okeahialam 1986). In the Capetown area of **South Africa**, a black nursing sister also suggested that taboos such as that against intercourse are things of the past. "How can a woman whose husband is a migrant labourer refuse to have intercourse when he returns home? She must, because otherwise she might lose him to the women in the city" (Thornton 1984:36).

Practices during postpartum confinement. A widespread practice in many traditional cultures is the custom of confinement or seclusion of the mother during the postpartum period. Many of the practices followed at this time may be quite conducive to successful lactation. For example:

- o In **China, Taiwan, and Sarawak**, as well as elsewhere among Chinese populations, women traditionally "do the month," during which they are confined to home and follow an extremely restrictive set of proscriptions and prescriptions. While such rules as that against washing may appear dysfunctional, the belief that a large number of chickens and certain other high

protein foods should be eaten during the period may be quite beneficial both for maternal health and establishment of a good milk supply (Pillsbury 1978, Koh 1981). This custom is common throughout much of Southeast Asia.

- o In **Sudan** the nursing mother is allowed to rest for 40 days, while duties are performed by the grandmother or others. Neighboring women often share foods such as meat, milk, and the national wheat bread (El Shazali 1982).
- o In one area of **Papua New Guinea** a period of seclusion is prescribed, but only one week in length. An excellent study of infant feeding practices in this culture suggests that because "the main tensions in interpersonal relations are among the sexes, prohibition of male contact during this critical period may further promote mother-child bonding and successful initiation of lactation" (Conton 1985:45).

Using Breastmilk Substitutes

Variations in breastmilk substitutes. The variation in types of substitutes given in place of breastmilk in low-income countries is wider than originally believed:

- o At the village level in Ogun State, **Nigeria**, for example, a team from the College of Medicine in Lagos saw feeding bottles everywhere, but no tins of artificial milk. The white substance in the bottles was not milk at all but pap, the local maize weaning food. It was made very diluted in order to be given from a feeding bottle, so diluted that it contained very few calories. The bottle itself was felt to be the important thing (CMC 1986:7).
- o In **Cairo**, in addition to breastmilk, infants up to three months of age typically receive bottle-fed sugared water and water boiled with sugar and caraway or fenugreek (Hoodfar 1986:29).
- o In a hillside shanty town in northwestern **Brazil** mothers only use the breast "as an early and not every dependable supplement to the staple infant food, mingua, a thin cooked gruel of fine manioc flour, sugar, water and powdered milk. And since many mothers cannot afford sufficient powdered milk they often reduce or eliminate it and make a thinner cereal called papa" (Scheper-Hughes 1984).

The often used framework of breast versus artificial milk obscures the wide range of existing patterns (Gussler and Mock 1983:84). It is extremely important to learn about the common range of culturally-accepted infant feeding practices in order to understand the nutritional significance of the "mixed feeding" category (Winikoff 1981:178, Winikoff & Laukaran 1989, Lantham et al. 1986).

Problems with preparing and using breastmilk substitutes. Problems with breastmilk substitutes are pervasive, arising at many stages in the preparation and feeding process. Common difficulties in making a safe feed arise from:

- o Preparing the formula without washing hands
- o Using packages left open, or stored in a warm or humid place
- o Using bottles and nipples that are difficult to clean
- o Using water that has not been boiled, due to lack of fuel, time, or understanding of its importance (Cameron and Hofvander 1984)

An interesting debate has arisen concerning the hygienic value of using a cup and spoon over more difficult to wash bottles. Raphael (1982:12) suggests that cup and spoon may not be much superior, citing evidence in **Gambian** villages that the bacterial count in traditional vessels used for feeding, such as metal bowls (washed and dried) is so high that "whether bottles and nipples are more contaminated and cups are easier to clean becomes irrelevant" (Barrell and Rowland 1980). Most experts, however, believe cups and spoons are somewhat less likely to be contaminated and, in addition, do not interfere with the suckling actions necessary for successful breastfeeding.

Problems of making feeds of correct concentration. Many field workers have emphasized that preparing feeds of correct concentration is a difficult problem, for several reasons:

- o Labels may have too much printed on them, be too small, or written in a foreign language
- o Measuring scoops are often awkward to use, especially if instructions are given in half scoopfuls
- o Measuring methods may vary, with different brands asking for scoopfuls heaped, rounded or level. If the powder has to be shaken with water, the level-line may be difficult to see
- o Proper utensils may not be available
- o When the amount of powder is related to the infant's age or weight it may be confusing to many mothers (Cameron and Hofvander 1984)

In the West and in a few developing country areas over-concentration of formula may be a problem. In **American Samoa**, for example, children and adults often have problems of obesity. Not only weight but also size of skinfolds were found to be lower among five- to seven-year-olds who had been primarily breastfed (Bindon 1985).

In most cases, however, over-dilution appears to be the major difficulty. In a disquieting study of "the bottle-starved baby", mothers at a health center in the capital of **Yemen Arab Republic** were questioned on how they filled their bottles. Of 194 mothers using powdered milk, 19 percent prepared it with a reasonably correct concentration, 64 percent made it too dilute, and only 17 percent too strong. A small minority (12 percent) made it with less than half the proper concentration. In infants under six months of age, artificial milk feeding carried a more than eight-fold increase

in risk of severe malnutrition when compared to exclusive breastfeeding. As would be expected, mothers from poorer families had a greater tendency to over-dilute the powdered milk. The fact that the problem of over-dilution was found to be greater with milk brands which have smaller scoops for measuring offers some hope that educational efforts be partially successful in correcting the problem. The analysis suggests, however, that provision of supplements for bottlefed infants under six months of age needs to be considered as well (David and David 1984).

The Weaning Process

Terminology. One major difficulty in studies on weaning is the fuzziness of terminology. Some authors use the term "weaned" to refer to a child who has been breastfed and is beginning to receive some form of supplementation, while others use "weaned" to refer to the child who no longer receives the breast at all, or to refer to the change to solid food (Cole 1977:1-2). Several investigators have suggested a standardization of terms, with "weaning" used to refer to the process of establishing dependence on food other than breastmilk and "sevrage" used to denote the complete cessation of breastfeeding (Conton 1985:44, Brown 1978:2067).

Great variations in meanings attached to "weaning" terms are also found within traditional cultures (Raphael 1979, Raphael and King 1977). Most women in one **Mexican** village, for example, initially reported that weaning was very abrupt and that no "foods" were given prior to sevrage, whereas in reality children were allowed to become familiar with foods at their own pace. Mothers did not regard nibbling or tasting foods as involving any supplementing of breastmilk (Millard and Graham 1985a:177-8).

Criteria for beginning the weaning process. Criteria vary widely for deciding when the feeding of semi-solids and solids should begin. Certain cultures associate the introduction of solids with the first tooth, as in **China** (Sidel 1973). In **Nepal** the initiation of solid foods is marked by a "rice feeding ceremony" at six months (Graves 1984:182). In some cultures, feeding simply begins "when child asks for it." In many societies, another pregnancy may bring a rather abrupt completion of the weaning process.

Weaning foods. The first weaning food introduced is often a gruel or starchy paste made of maize, rice, oatmeal, wheat, potatoes or crushed plantain (the main ingredient being the local staple) (Brown 1978:2088). In **Cairo** common weaning foods include rice water, boiled and mashed potato, rice cooked in milk, biscuits, bread soaked in tea, boiled or mashed squash. Wealthier families sometimes add yoghurt or egg yolk (Hoodfar 1986:29). In South Orissa, **India**, diluted millet, rice, barley sago and arrowroot are commonly offered (Devi and Behera 1980:755). In certain **Haitian** villages the supplementation system is quite complex, with two intervening phases, manje dous (sweet food) and manje sel (salt food), marking the gradual movement toward adult foods (Alvarez and Murray 1981:46-58). In some cultures the child goes

directly to semi-solids or solids from the adult diet, as in certain parts of **Sudan, Somalia, Saudi Arabia, Lebanon and Syria** (Brown: 1978:2067).

The nutritional value of foods offered varies. Often it is quite poor, if little else is added to the local carbohydrate base. In many societies restrictions or taboos related to the weanling's diet may also limit the variety of foods received, even when the family can afford more nutritious food and older children eat it. In one culture eggs are believed to make the hair fall out or to cause the child to become a future thief. In another, fish is thought to cause parasites (Brown 1978:2068). In certain parts of **Nepal** villagers believe that eggs and meat should not be offered until the eruption of all the teeth (Graves 1984). In some cultures, however, nutritious ingredients are traditionally added, as in **Tanzania** where in certain pastoral communities porridges are enriched with cow's milk and in farming communities groundnut flour is often added. (Kimati 1986).

Food belief systems. Beliefs concerning appropriate weaning foods are usually related to the larger system of "folk dietetics" within a particular culture. In an Anthropological Approach to Nutrition Education, Mark and Mimi Nichter provide a valuable and detailed overview of common food systems and how they can be investigated and adapted. They discuss the importance of developing supplements structured around indigenous health concerns such as hot/cold, habitation, digestibility, and differences between "meals" and "snacks," as well as such issues as seasonal availability and body state. They suggest the importance to nutrition educators of "transformation strategies" through which under-utilized but valuable nutrient sources may be instrumentally or symbolically altered to make them more acceptable. These include, for example:

- a) consuming a food in a different stage of ripeness,
 - b) consuming a different or particular part of a plant,
 - c) eating one food in combination with another food,
 - d) consuming a food at a particular time of the day (e.g., a "hot food" in the cool morning), or
 - e) preparing a food in a different way (baking, boiling, fermenting, sprouting)
- (Nichter and Nichter 1981:42-43).

Methods of feeding. Wide variations exist in how weaning foods are fed to children. In many cultures thin paps of various types are commonly fed in bottles (Gussler and Mock 1983, CMC 1986), in others they are given by cup and spoon. In **Cairo** mothers often crush beans between their fingers and then allow the baby to suck them (Hoodfar 1986:28). In some parts of **Burma, New Guinea, and East Africa** mothers prechew adult foods and then feed infants small pieces with their fingers. In certain traditional families in **Nigeria** these prechewed foods are fed with the tongue. Force feeding with the hand is customary in certain parts of **West Africa** (Brown 1978:2068).

Problems during preparation and feeding of weaning foods. Problems with contamination during preparation, storage, or feeding are extremely common. Reports are widespread of food being left uncovered or stored for long periods, children helping themselves to the pot at will with dirty hands, or foods being reheated or served cold after long periods (Hoodfar 1986; Ekeh 1980, Huffman and Huque 1983). Several sobering studies have measured weaning food contamination after common periods of storage. In **The Gambia** foods are often cooked to meet the needs of the entire day or stored over night. Even after the first hour tests showed the proportion of foods dangerously contaminated to be high during the rainy season. After eight hours almost all were hazardous. Unfortunately the seasonal nature of intensive farming activities results in standards of child care being lower during the rainy season, just when levels of food and water contamination are at their peak (Barrell & Rowland 1979).

Poorer families may face many other difficulties in the preparation of weaning foods, such as lack of ingredients, water, fuel, and the scarcity of mothers' time for preparation of special foods (Raphael 1982, Alvarez and Murray 1981).

Intra-family patterns of food distribution and feeding order also affect what young children receive in a number of cultures where women and children are fed last (Ekeh 1980, Chen et al. 1981, Behrman & Kenan 1984b). (See the section on "Infants' Sex and Birth Order" for a more detailed discussion of this topic.)

In many rural communities where women spend long hours in agricultural or other work away from the household, older siblings may frequently be responsible for feeding the infant. These sibling caretakers may be very young (five or six years of age), often contributing to the problems of poor feeding and contamination.

Critical periods in the weaning process. Difficult times for children during the weaning process vary by culture, with several common patterns. In societies where very early introduction of foods is the rule, the practice interferes with successful breastfeeding, as well as introducing a major source of infection for infants at a particularly vulnerable age. Even when the weaning process is begun after four to six months of age, it can be very dangerous. The weanling is often deprived of most of the maternal antibodies provided by breastmilk while being started on foods that are often unfamiliar, difficult to digest or spicy, and exposed to a greater number of bacteria, parasites and insects (Brown 1978).

In cultures where breastfeeding is prolonged to well over two years and very little food is given in the interim, the most severe difficulties may be encountered well before weaning takes place. In certain parts of **Mali** the frequency and severity of malnutrition actually declines in the post-weaning period since it is preceded by a more difficult period of lengthy breast-feeding with little supplementation (Diarra et al. 1986, Dettwyler 1988b). In **Asia** there are similar problems due to the reluctance to provide much supplementation before weaning is completed, often late in the second year (Sharma 1983, Angrove and Gunning 1986, Awasthi et al. n.d.). Ghosh (1982) reports that in parts of **India** "the period between six months and two years is one of

continuous hunger. The marasmic state of this period is assumed to be normal." Both he and members of the MODE team involved in nutrition education investigations in **India** report a reluctance on the part of many mothers to introduce much food before weaning. Feedings are often sparse and too few in number, with many mothers expressing disbelief when told that their one- to two-year-olds need half the food they themselves eat (MODE 1986).

Useful Studies. Several studies provide a particularly good overview of the weaning process and methods for studying it. (See, for example, Gibbons and Giffiths 1984, Brown 1978, Nichter and Nichter 1981). Detailed ethnographic studies illustrate the richness of tradition surrounding weaning beliefs and practice in particular cultures (e.g., Alvarez and Murray 1981, Millard and Graham 1985a, Diarra et al. 1986, Dettwyler 1986b and 1987a).

Terminating Breastfeeding

The duration of breastfeeding. Recent studies indicate quite striking regional differences in the average duration of breastfeeding. A recent review of data from over 1000 studies during the period 1980-1989 indicates that the average duration of breastfeeding is longest in **Africa** (14-24 months) and **Southeast Asia** (3-25 months), somewhat shorter in the **Western Pacific** (10-14 months) and the **Eastern Mediterranean** (6-19 months) and shortest in Europe (2-9 months) and the **Americas** (1-19 months). There are large disparities between countries and different population groups within countries. However, population groups with similar lifestyles (e.g. the rural or the urban groups) tend to behave in a similar manner, with rural populations tending to breastfeed more than urban ones in any region (WHO Wkly Epidem. Rec. 1989).

There are two particularly dangerous patterns of weaning: 1) very early and 2) very late, if sufficient supplementary foods are not given after four to six months.

The situation in one shantytown in northeastern **Brazil** illustrates the first extreme, where total weaning from the breast is completed as early as the second week of life and rarely any later than the third or fourth month. Infant mortality rates are much higher than just a few decades earlier when mothers breastfed for one or two years (Scheper-Hughes 1984).

A UNICEF study in the slums of **Bombay** illustrates dramatically the other extreme. The poorest group studied in Bombay were migrant women working on construction sites who exclusively breastfed their babies for at least 18 months. "The creche doctor pointed out that most infant deaths took place between the ages of one and two years, when breastmilk alone is far from a sufficient diet...These women are desperately poor, with little to pay for nourishment, but, in addition, most of them hold firmly to the belief that a baby should not be fed solid or semi-solid food until weaned" (Sharma 1983:17).

Techniques for weaning. Techniques for physically completing the weaning process are common throughout the world, although the particular substances or strategies may vary. Some groups believe that children should wean themselves gradually and not be forced (Conton 1985). More assertive approaches used in various cultures include:

- 1) hiding the breast and in some areas sewing up the blouse or dress in such a way that the child can't uncover it,
- 2) giving the infant special foods to distract his attention and compensate for his loss,
- 3) applying repulsive substances to the breasts, such as strong spices, cactus juice, bitter jelly from the leaves of the aloe tree, or black paint that the child is told makes the milk "bad" or is due to worms, and
- 4) giving the child to another caretaker until he forgets about the breast or taking a trip away without him for several weeks (Alvarez and Murray 1981, Darwish et al. 1982, Diarra et al. 1986, Hoodfar 1986).

Reasons for terminating breastfeeding. It is fascinating to explore the reasons women themselves give for terminating breastfeeding. A wide variety of explanations are offered, but some themes recur again and again.

Tiredness and work conflicts. One common theme is tiredness and competing time and work constraints. Women in **Cairo** observed that "it made them tired and they couldn't cope with it" (Hoodfar 1986). In the **Philippines** certain urban women believe that "if a working mother breastfeeds her infant will suck her 'tiredness' and suffer vomiting, diarrhoea or poor growth" (Simpson-Herbert et al. 1985). In some cases women observe that the type of work they do is at times incompatible with breastfeeding. This is true for itinerant market women in **Haiti**, who feel pressure to resume their travels to Port-au-Prince for economic reasons but are very reluctant to take their babies into areas they feel are unsafe (Alvarez and Murray 1981:64). And it is true for women in the village of Ahjur in **Yemen Arab Republic**, where much of the work takes mothers outside for long periods, but many believe that babies should stay in the house for the first year of life (Adra 1983:32-34). The effects of women's work on breastfeeding will be explored further in the second section of this paper.

Illness and pregnancy. Various physical conditions are reported by mothers to influence their decisions to wean their infants. In many cultures illness of the mother or child is seen as a reason to stop (Beckerleg 1984, Simpson-Herbert et al. 1985: 140). A small percentage of women in many cultures report that physical problems such as cracked or sore nipples or abscessed or infected breast. have caused them to terminate breastfeeding.

Pregnancy is very commonly given as a reason for sevrage. In many cultures it is believed that pregnancy alters the mother's milk, making it harmful to the breastfed infant (Hoodfar 1986, Adra 1983:38, Diarra et al. 1986:35). How soon after conception mothers cease of breastfeed can vary from almost immediately until up to the third trimester (Huffman et al. 1980, Conton 1985). The stated "ideal" practice may vary from what women actually do (Millard and Graham 1985a:178).

Psychological factors. Psychological factors often play a role. A negative image of breastfeeding and how it appears and affects their bodies is said by some women to influence their decisions. An ethnographic study in **Cairo** reports that modern women of higher economic status rarely breastfeed longer than three months. The act of breastfeeding is felt to be "primitive," "animalistic," and "shameful" by certain women, especially when men are around. Some feel it is almost a shame that women have to do it, "like many other things women have to put up with because of their sex, such as menstruation" (Hoodfar 1986:25). Women in some cultures worry because they believe breastfeeding will hurt their figures or cause their breasts to sag (Booth 1985:50).

Strong or negative emotions are believed to affect the quality of breastmilk in some cultures. In parts of the **Yemen Arab Republic** "breastmilk is widely believed to have powerful inherent qualities and to provide a vehicle for various mental and physical states which are transmitted from mother to child." Fear and anger can both turn a mother's milk bad (Beckerleg 1984). In certain villages of **Haiti** a formerly minor belief complex, let gate (the "spoiled milk syndrome") has become quite common. The most frequent cause of this condition is a violent negative emotional state often brought on by marital conflict. The conflict turns milk into a poisonous substance that may harm or kill the child and cause serious problems for the mother. If a woman becomes affected, she must immediately wean her child, even if the child is very young. Women affected by this syndrome are entitled to special treatment and freed from the obligation to generate income in the marketplace (Alvarez and Murray 1981).

Insufficient milk. Probably the most common reason given worldwide for terminating breastfeeding (or starting artificial feeding) is "insufficient milk"--a phenomenon which has caused widespread debate. The most simplistic explanation would be that some woman just do not have enough milk. It is unlikely, however, that insufficiency of milk is caused by maternal malnutrition, since a higher proportion of women in developed countries than in poorer nations report insufficiency (Huffman 1984). It appears that this response is often given because it is more socially acceptable than to admit that bottlefeeding is more convenient or less embarrassing (Raphael 1979). The response may also be easier to articulate than other reasons, such as that "my social network didn't expect me to breastfeed" (Hornik 1985).

Another aspect is that lactation is quite frequently impaired by the stresses in modern urban society, but that mothers are often hindered when searching for solutions by their lack of understanding of the dynamics of lactation. Mothers may be correct in assuming that their fussy infants are hungry, but incorrect in believing something is inherently wrong with their milk production. They often offer the bottle

which quiets and satisfies the baby, but reduces suckling and further lowers milk production. Women in urban areas where breastfeeding is not common and social support is often unavailable need to learn more about the most appropriate way to deliver breastmilk to their infants and be offered encouragement (Gussler and Briesemeister 1980, Huffman 1984:174, Simopoulos and Grave 1984:611).

Conclusions and Recommendations

1. Choice of feeding method. Project personnel seeking to influence women's initial choice of feeding method should consider both the reasons mothers themselves give and factors actually associated with the decisions they make. The timing of the feeding decision should also be explored, so that educational efforts can be scheduled before the majority of women have already made up their minds. Feeding patterns in developing countries appear to be much more complex than simply "breast versus bottle." Early introduction of breastmilk substitutes (often while breastfeeding is continued) is a major problem. Research has shown that many mothers make their initial choice of feeding method even before pregnancy. The timing of feeding choices should be examined further, so that educational efforts can be correctly targeted.

2. Colostrum and Prolactal Feeds. Feeding practices immediately following birth should be explored by infant feeding projects in more detail, due to the important health benefits of colostrum and the danger that prolactal feeds may be contaminated and interfere with the suckling reflex. Breastfeeding was delayed at least 24 hours in more than half the cultures examined in one report. The few ethnographic studies available that focus on this period indicate that much richer information is available than is gleaned from most surveys.

3. Detrimental feeding practices. The prevalence of feeding practices that inhibit suckling (such as scheduled feeds, lack of night feeds, and the use of pacifiers and bottles) should be determined, since these practices may eventually lead to lower milk output and termination of suckling. Feeding on demand and night feeding appear to be common in most traditional societies, but more rigid practices have been adopted by some urban and elite groups.

4. The importance of exclusive breastfeeding. The extent to which exclusive breastfeeding is practiced should be examined since breastfeeding without supplementation during the first four to six months of life has been shown to substantially decrease infant mortality rates in poor environments. In much of the world mothers are surprisingly unaware of the benefits of exclusive breastfeeding and tend to begin feeding other substances at a very early age, even if breastfeeding continues. The protective antibodies and valuable nutrients in mothers' milk, as well as the decreased likelihood of contamination and infection when infants are breastfed exclusively, has been shown to increase by several fold high-risk infants' chances of survival.

5. Restrictions and special practices. It is important to encourage cultural practices that help establish successful lactation, as well as explore whether restrictions or taboos with negative consequences need to be changed. Practices such as the prescription of a greater quantity of higher protein foods during breastfeeding should be identified and reinforced. Traditions involving a period of confinement during the postpartum period are quite helpful in encouraging lactation. The woman often receives a much needed rest from arduous tasks and commonly has a right to special foods which help her recuperate and establish a good milk supply. Restrictions are more common in a number of cultures. Positive beliefs should be supported while negative beliefs can at times be "culturally negotiated."

6. Breastmilk substitutes. It is critical to understand the wide variations in types of breastmilk substitutes being given and the nutritional value of common substances that are offered. Substances given by bottle, for example, very often contain little or no artificial milk, and provide little protein or even calories.

7. Difficulties in preparing safe feeds. Problems in preparing safe feeds for artificially fed infants, as well as the critical error of over-dilution, should be addressed. Problems of contamination are widespread, due to unhygienic conditions and faulty storage and preparation techniques. Over-dilution is very common in low income areas, leading to a much greater risk of malnutrition among bottlefed infants. Correlations between the size of scoops and over-dilution in one study suggest that education can make some difference. It may be necessary, however, to direct some resources toward providing extra calories to "bottle-starved" infants.

8. Weaning foods. The nutritional content of local weaning foods should be explored, and techniques developed, when necessary, for introducing healthier foods in larger quantities. The first weaning food in many societies is a gruel or starchy paste, the main ingredient being determined by the local staple. Taboos often limit what is allowed in the weaning diet. Useful strategies have been developed for exploring local food systems and structuring change efforts around indigenous health concerns such as the hot/cot ideology, habitation, and digestibility, as well as for using various "transformation strategies".

9. Termination of breastfeeding. Particularly dangerous customs related to weaning should be explored, including 1) the tendency in some societies to terminate breastfeeding very early when breastmilk is still quite sufficient and the infant is extremely vulnerable to infection, and, 2) the practice in some cultures, on the other hand, of breastfeeding for extremely long periods without provision of adequate supplementary foods after the infant reaches four to six months of age. Mortality rates sharply increase when infants just a few weeks of age are introduced to contaminated artificial feeds which are often poor in nutritional value as well. In some cultures, on the other hand, there is a reluctance to feed older infants much supplementary food before they are totally weaned, often as late as two years or older. Malnutrition and mortality in these cultures is often higher in this period than after sevrage is complete.

II. Health Providers and Institutions - Their Effects on Feeding Practices

Issues for Project Design and Implementation

How knowledgeable are health providers involved in maternity-related services concerning breastfeeding physiology, correct infant feeding practices and related hospital policies and procedures?

What effects do factors such as social status, education and formula promotion have on health providers' knowledge and practices related to infant feeding?

What percentages of mothers in the local area and country as a whole (both urban and rural) utilize western style maternity services for child birth related care?

To what extent do hospitals and other maternity services follow policies and procedures known to have detrimental effects on breastfeeding?

Health providers and their institutions can have a powerful effect on mothers' infant feeding beliefs and practices and, unfortunately, often their influence is not positive. While mothers in traditional rural areas often deliver at home, in many urban areas hospital or maternity deliveries are quite common. And often, even in rural areas, although many women give birth at home, contact with modern health providers and institutions before or after delivery is quite common.

Thus, when exploring behavioral issues affecting breastfeeding, weaning and nutrition, it is essential to focus not only on the beliefs and practices of mothers and families, but on the knowledge and practices of health providers and their institutions as well. This section will explore both the knowledge and practices of health providers and institutional policies and procedures affecting infant feeding. Ways in which creative changes in education for health providers and in institutional procedures can positively affect both infant feeding and child survival will be discussed in Section Five.

Knowledge and Practices of Health Providers

Health workers' knowledge of correct feeding practices.

Several studies have given disquieting feedback concerning what health workers may generally know and think about breastfeeding, in the absence of special educational efforts.

- o A study in a metropolitan area near **Manila** in the **Philippines**, for example, found health personnel shockingly ignorant of basic aspects of breastfeeding and lactation management:
 - o Only 18 percent of the doctors knew about the let-down reflex.
 - o The majority of health personnel reported they would wait at least 24 hours after birth to initiate breastfeeding, with more than half recommending bottlefeeding until the mother's milk "comes in."
 - o Approximately 60 percent of the health providers felt nursery care was wiser than "coming-in" arrangements, and
 - o A majority also thought it would be a good idea for representatives of milk firms to visit newly delivered mothers (Burgess 1980).
- o A survey conducted by the Breastfeeding Information Group in maternity wards and MCH clinics in hospitals throughout **Kenya** discovered a similar lack of knowledge.
 - o Only 65 percent of the workers questioned knew of the let-down reflex and only 20 percent knew that the suckling reflex was strong shortly after birth.
 - o Only 14 percent of the maternity staff gave the baby to the mother for suckling within 30 minutes of the birth and a full 44 percent waited more than four hours.
 - o Only 4.7 percent gave no pre-lacteal supplements to normal newborns, and 86.9 percent believed breastfed babies need boiled water when less than a week old (Veldhuis et al. 1982).
- o A baseline survey for a large breastfeeding promotion program in **Brazil** also discovered poor understanding and faulty practices among health personnel there. Of 200 health care providers questioned in health centers and maternity wards in the cities of Sao Paulo and Recife:
 - o 95 per cent of the attendants and auxiliary nurses did not know the physiology of lactation and how to treat and present problems.

- o 60 per cent of the health care personnel prescribed substitutes at the mother's first request.
- o 60-70 per cent had had limited training with regard to breastfeeding. At the same time, they had been exposed to intensive formula promotion (monthly visits) by industry representatives compared with an absolute absence of any advocacy in favor of breastfeeding.
- o 90 per cent of the obstetricians felt that breastfeeding was not an issue in their area of concern (Marin 1988).

This sobering picture of the general lack of knowledge of correct infant feeding practices among many health professionals gives some indication of why institutional policies and procedures may not be ideal.

Factors Affecting Health Providers' Knowledge and Practices

In understanding the factors that affect health providers' knowledge and behavior it is important to explore issues related to social status, education and formula promotion.

The influence of social class and roles. Health providers themselves usually come from positions in society in which bottle-feeding is an accepted norm. As a study of **Cameroonian** health personnel observed, there is often a conflict between the values of the health professionals' social class, what they see their teachers doing, and what they are taught:

Nurses and midwives resemble Raphael's (1973) "elite bottle feeder". But they suffer a conflict between social role values that esteem bottle feeding, and professional education that says "breast is best". Their teachers have been urbanites, who tend to bottle feed their own children, teach bottle preparation and touch on breastfeeding theory (Garrett and Ada 1982).

Professional education. Instruction in the areas of breastfeeding and lactation management has been found to be notoriously weak in the curricula in schools for health professionals in much of both the western and developing world. An assessment of the status of nutrition and breastfeeding education in the curricula in medical schools in **Mexico** shows a situation not uncommon in many other countries:

In most cases, there is an inadequate understanding of the social reality of the country. For example, at an academic level, nutrition is not a priority subject in a country where the most serious health problem is malnutrition. The curriculum of most medical schools handles nutrition in small doses in different subjects, such as biochemistry, endocrinology, and paediatrics, where the biological, individualistic nature of the medical model evidently prevails. The knowledge imparted specifically on breast-

feeding is very limited and is generally referred to in paediatric classes. The advantages of this type of feeding over any other are often stated very superficially. However, there is always a greater emphasis both in class time and in printed material on the preparation of milk formulas. Breast-feeding techniques are rarely mentioned, and the same may be said for solving the possible problems which can occur in breast-feeding.

By way of confirmation of the above, we carefully analyzed the space devoted to artificial formulas in textbooks and found that this was ten times more than that devoted to breast-feeding. (Ysunza-Ogazon 1984).

Formula promotion. Pressure to promote bottle-feeding rather than the breast become even stronger in many settings, if still subtle, once students are on the job. Although many baby formula companies may no longer publicize their products to the general public, the promotional job focused on health personnel is very powerful in itself. As the study of **Cameroonian** health personnel observed:

If nearly half the personnel were motivated to try a particular brand by various promotional activities and they recommend the brand they have tried, then promotional efforts have only to reach personnel to achieve the desired multiplier effect. The impact is conceivably much greater than any mass media endeavour might have. If most mothers seek the advice of health personnel regarding milk products as did the majority of 365 mothers of hospitalized Cameroonian children studied by Garrett (1981) (Garrett and Ada 1982:214).

(Issues related to the availability and promotion of breastmilk substitutes are explored in more detail in Section Three.)

Institutional Policies and Procedures

Use of western style institutions during birth. The percentage of mothers that utilize western style maternity services for child birth related care varies widely throughout the world. For example:

- o A five country study focusing on the hospital environment and infant feeding (Covington et al. 1985) found that only 10% of pregnant women gave birth in hospitals in **Bangladesh** and **Liberia**, while 35% used the hospital in **Egypt**, 53% in **Jamaica**, and a full 85% in **Sri Lanka**.
- o A study of urban areas in four countries (Winikoff et al. ed. 1988) found an unexpected degree of modern maternity services used by women in the four sites. Only 2% of all **Bangkok** births, 10% of all **Bogota** births, and 22% of **Nairobi** births did not occur in a hospital. Even in **Semarang**, the least westernized site, over 50% of the deliveries were in hospitals (Winikoff and Laukaran 1989).

While the range of hospital use for deliveries world wide is great, a large percentage of women, especially in urban areas, give birth in hospitals or maternities. Thus procedures and practices in these institutions related to infant feeding affect a substantial percentage of the world's mothers and babies.

Detrimental policies and procedures. Institutional practices that have deleterious effects on breastfeeding are numerous. Some of the common practices suggested to be most detrimental include:

- o Routine use of drugs during childbirth
- o Automatic separation of the normal mother and baby immediately after birth
- o Use of glucose water as a prelacteal or first feed
- o Routine use of infant formula for feeding in the hospital
- o Use of separate nurseries for normal infants rather than organizing "rooming-in" alternatives
- o Distribution of free formula samples on discharge
- o Performance of Caesarian sections when not medically indicated
- o Lack of arrangements for providing breastmilk to premature newborns and sick infants through breastmilk banks or other mechanisms

(Caribbean Food and Nutrition Institute et al. 1982:52, Narayanan 1985:169)

Studies of hospital policies and procedures. Numerous research studies in the past few years have produced a disturbing picture of policies and procedures related to infant feeding in many hospitals and maternities, although the situation is gradually changing in some places. For example:

- o The survey conducted in the cities of **Sao Paulo** and **Recife, Brazil**, at the commencement of the Brazilian breastfeeding promotion program, indicated that:
 - o 50 per cent of the maternity units used drugs that might inhibit the sucking and let-down reflex.
 - o In 70 per cent of the maternity units, the absence of rooming-in, the existence of rigid breastfeeding schedules, the use of mothers in nurseries, and delay in bringing the infant for the first feed (after 12 hours) were routine practices (Marin 1988:155).
- o The four country study conducted by the Population Council found that in every site, "a certain percentage of the babies stayed, not with their mothers, but in a separate hospital nursery. This ranged from a low of 15% of hospitalized births in **Bogota** to an incredibly high 81% of all hospital births in **Semarang**...Because of the differing percentages of births in and out of hospitals, this meant that about 15% of all babies were separated from their mothers at birth in **Nairobi** and **Bogota** and about 45% were separated in **Bangkok** and **Semarang** (Winikoff and Laukaran 1989:864)."

Data from the above four country study demonstrated that separation of mothers and babies was associated with a higher likelihood of receipt of formula samples and that babies were often fed by bottles in the nursery. Multiple logistic regression techniques used in the study showed that, even after controlling for education, income and other background variables, giving birth in a hospital (relative to home delivery) in **Nairobi** was positively related to bottlefeeding. Similarly, in **Semarang**, after controlling for socio-economic differences, a physician attendant for the delivery of a child was significantly associated with use of the bottle and less breastfeeding. And finally, in **Bangkok**, among mothers who were not working, not rooming-in was associated with significantly less likelihood of continued breastfeeding (Winikoff and Laukaran 1989:864-5).

An excellent case study of the dynamics affecting infant feeding in a large urban hospital in the **United States** (Winikoff et al. 1986, Laukaran et al. 1984) provides vivid examples of the subtle types of institutional procedures that may quite effectively discourage successful breastfeeding. For example:

- o Before a mother could initiate breastfeeding she had to receive pediatric clearance to ensure she wasn't on drugs that would harm the baby. A mother and baby were observed waiting as long as 12 hours for this clearance.
- o Prescriptions for infant formula were written routinely, even if the mother planned to breastfeed. On one occasion when a mother was experiencing difficulties in breastfeeding, neither the nurse or physician gave any advice on correct breastfeeding techniques before providing formula.
- o Orders for bromocriptine for lactation suppression were also written routinely, and at times breastfeeding mothers were given it inadvertently.
- o Postnatal classes were sporadic and most often emphasized how to obtain and use formula rather than breastfeed.

It was not surprising that examination of hospital charts indicated that not one baby was exclusively breastfed on discharge. The study illustrates the detailed and sometimes alarming information that can be obtained through simple but systematic observation in the institutional setting.

Effects of institutional changes on infant feeding. Field programs in recent years have provided excellent examples, in a variety of developing country settings, of how changes in health institution policies and procedures can influence infant feeding practices and, most importantly, affect child survival. These interventions and their results will be explored in section Five.

Recommendations and Conclusions

1. Health workers and institutions. Personnel working to improve infant feeding should determine health professionals' knowledge of correct practices. They should also investigate the procedures followed by local clinics, maternity centers and hospitals that may have an important influence on mothers' feeding practices. Health professionals often have a surprising lack of understanding of the physiology of breastfeeding and little knowledge of simple lactation management techniques. A wide range of health institution procedures have been shown to have a critical influence on infant feeding success and survival, and yet few clinics and hospitals have made any of the recommended changes. An investigation of the extent of the problem is the first step in an effort to develop successful interventions.

III. Other Factors Affecting Feeding Practices, Nutrition, and Child Survival

Issues for Project Design and Implementation

What are the effects on infant feeding behavior and thus on child survival of factors such as:

- o Social networks and support systems
- o The socio-cultural environment
- o Women's work and activity patterns
- o Education and income
- o Infants' sex and birth order
- o The physical environment
- o Women's health and nutrition
- o The availability and promotion of breastmilk substitutes

What factors can most realistically be influenced during nutrition interventions?

Social Networks and Support Systems

The role of the "mother's helper" or doula. In most traditional societies the doula, an experienced mother given the task of helping new mothers, is a consistent feature. Raphael's (1976) survey of postpartum practices in 278 cultures found that almost all of these societies have a support system to assist the mother during this critical stage when she takes on the new responsibilities of motherhood. The mother's helper takes over many responsibilities, allowing the mother to relax and enjoy her baby, and can give advice in problems areas, such as breastfeeding management, if needed. In modern society, the loss of the extended family has meant fewer women have access to some skilled at giving this support. (Thorton 1984).

The influence of support systems. Social networks and support systems remain important in all cultures during the periods of pregnancy, childbirth, recuperation and lactation, even though the traditional doula role has disappeared in some areas. The category of individual that influences and supports the mother varies. Mothers, mothers-in-laws, husbands, and friends have all been shown to influence a mother's feeding practices (Pelto 1981, Huffman 1984). In **Hong Kong** bottlefeeding mothers reported being most influenced by medical professionals who did not support breastfeeding. Successful breastfeeding mothers, on the other hand, were influenced more by their social networks. Breastfeeding mothers who stopped

early differed from the other groups in the lack of support they experienced from friends and relatives (Hung et al. 1985). An interesting study in the **United States** explored effects of ethnicity on social support for the breastfeeding decision. The investigation found that among Black-Americans, support from a close friend was most important, while among Mexican-Americans the mother played the key role, and among Anglo-Americans, support from the male partner was important (Baranowski et al. 1983:1599).

While in rural areas women are exposed to other women who breastfeed and can learn through observation, in more urban settings this example is often not as readily available. The urban environment can cause a number of stresses which are maladaptive for successful lactation, as will be explored below.

The Socio-Cultural Environment

The effects of the socio-cultural environment on women's infant feeding practices are complex and far reaching. The section above examined one small but important part of the picture -- the effects of social networks and support systems. This discussion will explore three of the most important socio-cultural processes influencing feeding and nutrition: urbanization, migration, and fragmentation of social structures.

Urbanization. In general breastfeeding incidence and duration is shorter in the city. Data from the World Fertility Survey indicate that in 15 of 17 low-income countries surveyed the percentages of women breastfeeding their children is smaller for all age groups in urban than rural areas (Popkin et al. 1983). Urban-rural differences appear to be greater in Latin America than in Asia, where extended breastfeeding is more a general norm. Studies in particular areas such as the **Near East** (Akin et al. 1986b), **Bangladesh** (Ahamed 1986), and **Egypt** (El Mougi et al. 1981) have documented the same phenomenon.

What factors combine to produce this pervasive pattern? Major determinants include the following:

- o The desire as groups become more urban to become more "modern" and acquire material goods and technologies of more favored societies (Pelto 1981, Huffman 1984)
- o Emulation of upper classes or elite groups in the cities who bottlefeed
- o The tendency to work more outside the home, often in jobs less compatible with child care (Akin et al. 1981)
- o The greater availability and more intensive advertising of infant feeding substitutes in urban areas

- o Weaker social support systems and less encouragement of breastfeeding (Gussler & Brisemeister 1980, Raphael 1976)
- o Greater likelihood of using modern health services where personnel may encourage artificial feeding
- o Greater availability of cash for purchase of infant foods

Many of these influences and others are discussed in more detail in an excellent and thorough article by Popkin et al. (1983) on "Breastfeeding Determinants in Low Income Countries".

Migration. Urban immigrants may have special infant feeding problems. A study in **Jordan** found young infants to be especially vulnerable when urban immigrants confront severe economic and social relocation problems in their new setting (Akin et al. 1986a).

The overwhelming influence of the environment is illustrated by data on changes in feeding practices when immigrants arrive in new lands. Generally immigrants appear to adopt the feeding patterns of the new society, abandoning or greatly modifying those of their native culture. A study of Chinese in **Glasgow**, for example, found that only 2 percent of the Chinese babies born in Glasgow were breastfed, while 81 percent of those born in **Hong Kong** of the same mothers had been nursed. The same study reported that only 1 percent of the Scottish babies were breastfed (Koh 1981). A comparison of **Turkish** mothers living in the suburbs of Istanbul and Stockholm found that the duration of breastfeeding among the immigrant group in **Sweden** was significantly reduced. The immigrants' practices of early weaning and reliance on commercial infant foods and bottlefeeding were much closer to the practices of the host population. In such cases, risks of infection would be particularly great if weaned infants are taken home for visits during the first year of life (Koçturk and Zetterstrom 1986).

Poor infrastructure and fragmented social systems. Promoting breastfeeding is especially difficult in societies with poor infrastructure or fragmented social systems. In many urban areas of **Nigeria**, for example, inadequate housing, unpredictable and insufficient water and electrical supplies, and lack of an adequate public transport systems are the norm. The emotional and physical stress of working mothers living in peri-urban slums mitigates against successful lactation (Okeahialam 1986). Few Zulu mothers in urban **South Africa** receive any health education during their pregnancies and a majority are discharged from obstetric units within hours of their babies' births. Over 70 percent of the women questioned in one study introduced infant formula just a few hours after their babies' were born (Hopkinson 1987:47). Case studies of severely malnourished infants in **Kenya** found that many came from families that were severely disturbed, with the difficulties often following rapid social change (AMREF 1982 et al).

Women's Work and Activity Patterns

The question of whether and how women's work affects breastfeeding and other infant feeding practices has been hotly debated. One of the difficult challenges has been the search for research methodologies that will give reliable evidence.

Inconclusive evidence on the effects of employment on breastfeeding.

One exhaustive review of breastfeeding and women's work examined more than 60 surveys on breastfeeding. Most of the studies reviewed reported that less than ten percent of the women questioned stop breastfeeding because of the demands of employment (Van Esterik and Greiner 1981). However, as the authors themselves admit, not all studies specifically provided work or intention to work as a possible response, and answers to survey questions often provide unreliable data on the real reasons motivating behavior.

Work outside the home. Data from several good studies do indicate that breastfeeding is affected by the compatibility of the mother's work. "The hours when employment is available, its closeness to the mother's home, and the availability of work breaks that could be used to return home to breastfeed, on the one hand, or her ability to take the infant with her while she works, on the other hand, clearly influence breastfeeding practice" (Popkin et al. 1983:11). In the **Philippines**, for example, women who worked in their own barrios had similar rates of breastfeeding as those who didn't work, while breastfeeding was reduced for those who had to go outside the local areas for employment (Popkin et al. 1983:11).

One extensive infant feeding study in selected urban areas of **Thailand**, **Columbia**, **Tanzania**, and **Indonesia** attempted to get beyond the problems of self reporting by actually correlating employment status and infant feeding practices (Population Council 1984, Winikoff et al. ed.1988 and Winikoff & Laukaran 1989).

This study provided some valuable insights into the relationship between working outside the home, breastfeeding and weaning. Although mothers who work outside the home in the four urban sites studied tend to supplement more, work is clearly not the reason for most early supplementation. In an excellent summary of evidence on breastfeeding and bottlefeeding controversies from the research, the authors conclude:

... the evidence on work, bottle feeding, and cessation of breastfeeding can be read in two dimensions. One is the individual dimension, in which it is clear that work has a strong effect, in most cases, of pushing women toward bottle feeding, and that bottle feeding is clearly associated with early weaning. In some cases, work itself, independent of bottle feeding, is also associated with early weaning. On a societal level, however, it is clear that both early supplementation and weaning are much more common than is working outside the home. Thus, other influences must operate on women -- even women who do not work outside the home -- to influence them to use supplementary bottles and to wean early. This insight is important if one wishes to formulate policies

to address the widespread early mixed feeding and early weaning common in these urban areas.

Among the apparent predisposing factors for early bottle feeding are generalized consumer awareness of substitute feeding products and the possibilities for using them as breast milk substitutes. When combined with health services practices, becoming increasingly widespread, which both endorse the use of substitutes for mother's milk and offer mothers early experience in use of substitute products, the push may be almost irresistible (Winikoff & Laukaran 1989).

Women's activity patterns. Time allocation studies and ethnographic research have been of assistance in examining the dynamics that affect how mothers use their time. An investigation of household time allocation in 34 rural **Filipino** villages found that mothers spend significantly less time on bottlefeeding than breastfeeding. Other caretakers often spend as much time as mothers when the child is artificially fed. The study concluded that decisions about employment, housework, child care and breastfeeding are all interrelated. The choice of which activities the mother will do herself depends on their cost relative to the value of her time. If a mother can work for a higher wage than that of an older child, the child may substitute in her work at home so she can work outside (Popkin 1978). (Also see an excellent review time costs and savings to women of various child survival interventions by Leslie, 1987).

Data provided by ethnographies. Well-executed ethnographies can be invaluable in elucidating the factors affecting breastfeeding and women's work:

- o A fascinating study in **Ahjur, Yemen Arab Republic**, clearly describes the competing demands on mothers' time and how they affect feeding decisions. Work activities include food preparation, child care and feeding, clothes washing, and cleaning inside the house (taking an average of a little over three hours a day) as well as various tasks away from the home such as milking cows, fetching water, collecting fuel or helping with agricultural work, (taking three to five hours of a woman's time). Care and feeding of cows can take up to four to six hours per day. During peak agricultural seasons women may be out all day.

This study suggests that women from households that own little land often breastfeed longer than those whose families have large landholdings and are responsible for agricultural tasks that may be long and arduous. Extended family households are most conducive to breastfeeding, since task-sharing frees lactating mother for child care and feeding. Other mothers can often go to the fields in her place. One of the major cultural constraints that reduces the compatibility of women's work with breastfeeding is the belief in Yemen and certain other countries that an infant should be kept indoors for the first year of life (Adra 1983). This contrasts sharply with customs in many other parts of the world where women commonly carry their infants to the fields (Conton 1985, Kimati 1986).

- o An ethnographic study in rural **Nepal** also explores the effects of traditional work on child care and feeding in a society in which agriculture may be unusually demanding of women's time and may create special obstacles to caring for children. Hill agriculture relies heavily on the contributions of women, and their work is particularly arduous. In addition, in the more rugged sections of the Himalayas, travelling to distant fields with heavy loads of seed, compost, and agricultural tools is hard enough without carrying infants or small children too. In these societies children are left behind with substitute caretakers. The infants are fed supplemental cereal foods, often before the children are one month old, usually because their mothers are not available for much of the day to breastfeed during periods of intensive agricultural work. Breastfeeding, however, continues, whenever the mother is home. While bottlefeeding by urban working women in less developed countries tends in many cases to replace, instead of supplement, breastmilk, the early use of cereal foods in **Nepal** tends to supplement rather than replace the breast (Levine 1988).

Education and Income

Education. Level of maternal education appears to be negatively associated with breastfeeding in much of the developing world. Evidence suggests that women with more formal education breastfeed less (Jelliffe and Jelliffe 1978, Akin et al. 1986b, Butz et al. 1981). It is difficult to determine to what extent education itself affects breastfeeding. High levels of education are usually closely linked with many other factors, also known to be associated with lower levels of breastfeeding. These factors, for example, may include increased income, greater exposure to infant formula advertising, greater likelihood of working in formal employment settings less compatible with child care, and less likelihood of living in traditional households where support for breastfeeding is high. Many studies fail to adequately control for the large number of possible confounding variables. Use of such controls in some cases may eliminate much of the reported correlation (Akin et al. 1985).

In a few countries a positive association between education and breastfeeding has been found. In **Sri Lanka**, for example, more educated women were found to be more likely to initiate breastfeeding and continue it to recommended ages (Akin et al. 1981). Further research is needed to determine if the educational system provides more knowledge of the benefits of breastfeeding than in most other countries. In **Sao Paulo, Brazil**, also, the breastfeeding rates for the first six months of life were significantly higher among higher class, more educated groups. There the phenomenon may have been due to the greater impact of a recent breastfeeding campaign on mothers in more favorable living conditions (Monteiro et al. 1988).

Income. Many studies have also suggested that as the standard of living increases, breastfeeding declines (WHO 1981a). However, the effects of income are also difficult to separate from the effects of other commonly associated variables. Studies based on cross-sectional data with few or no controls have been inclusive.

Studies of the effects of income and assets on infant feeding could usefully include analyses such as those suggested by Popkin et al. (1983) which would examine:

- o whether women tend to leave market work for the home as income rises,
- o the effects of time-saving assets, such as refrigerators and piped water (which may, for example, encourage artificial feeding and at the same time reduce its health costs), and
- o whether part of the time freed up by modern appliances is used for breastfeeding (which may depend on whether the family views it as having positive benefits or as an less modern practice, best left behind).

One possible direct effect of greater income may be to allow women the choice of purchasing breastmilk substitutes which, when they were poorer, were completely unaffordable. A high proportion of income, however, is needed to satisfy the nutritional requirements of infants of working mothers who do not breastfeed. Often these needs are not met and result in a decline of the child's nutritional status (Huffman 1984). The cost of complete formula feeding for an infant of two months of age can be very high. Expressed as a percentage of salaries for selected jobs in different countries the cost is often outrageous, ranging from 6 percent to as high as 73 percent of monthly earnings (Cameron and Hofvander 1984:249).

Infants' Sex and Birth Order

The effects of sexual biases on child survival. Son preference and daughter neglect, which is reflected in biased feeding and child care practices, has been documented in certain countries. In some areas female infant mortality is substantially higher than would normally be expected. The most detailed studies of this problem have been made in **North India, Bangladesh and Pakistan**, although sex related differences in feeding practices have also been reported in other areas, such as the **Middle East and the Philippines** (Aguillon et al. 1982:101). A WHO report on "Health Implications of Sex Discrimination in Childhood" provides a useful overview and annotated bibliography on the subject (Ravindran 1986).

Data from the **Bangladesh** Fertility Survey show that female children are breastfed an average of five months shorter than male children (Ahamed 1986). A comparison of breastfeeding patterns in **Tunisia, Egypt, Jordan and Yemen** reports that boys appear to be breastfed longer in all countries but Yemen (Akin 1986b). Similar differences are also found in **Turkey** (Tuncbilek et al. 1983:17).

A bias toward boys in distribution of foods among family members is also common in some countries. Boys in certain parts of rural **India** are favored in the allocation of food, on the order of four percent in the lean season (Behrman and

Kenan 1984b:22). Malnutrition among girls is strikingly higher in some areas. In the **Punjab**, for example, a CARE study reported that in the severely malnourished preschool group 71.4 percent of the children were female and only 28.6 percent male (Ghosh 1986:11). In some regions differences may be more pronounced in more favorable situations, with boys benefiting more from the post-harvest "relative abundance" of food (Brown et al. 1985) and girls experiencing greater neglect compared to boys in higher class, landed families (Miller 1987:101, Bhuiya et al. 1986:23).

A well-structured exploration of sex bias in family food allocation in rural **Bangladesh** reports that female mortality may exceed male mortality by as much as 50 percent in the one-to-four year age group. Local female workers counted spoonfuls of food distributed to individuals in a sample of families. Female intake was 16 percent lower for the under-five group. While similar differences were reported for all other age groups, the differences disappeared when adjustments were made for weight, pregnancy, lactation and activity. The bias remained in the one-to-four year olds. It is interesting to note that in this study observers found that it was women who distributed the food within the family and that, contrary to customary descriptions, men rarely made demands for extra food beyond what was apportioned (Chen et al. 1981). Whether it was likely that the observations in any way altered typical practices was not discussed.

What are the cultural and economic dynamics that may account for this phenomenon of systematic bias? Investigation in **North India, Pakistan** and **Bangladesh** offer similar hypotheses for the practice in this area of the world. They suggest that sex-biased behavior is related to the inferior status, role and work opportunities of the women in the region. Sons are economic assets, needed for farming. They also provide better prospects for good returns if they take income-earning jobs. Sons stay with the family after marriage and thus provide old age security, while daughters marry out, draining the family through required dowries and gifts in the process. It is interesting that in other regions of **India**, where the crops and farming methods are different and female agricultural work is more highly valued, problems of female neglect are not widespread (Chen et al. 1981:66, Miller 1984:111 and 1987:100).

A study of differential child care in several communities in **Tibet** (Levine 1987) suggests that while sex biases are important there, the issue is not simply discrimination against daughters, but large-scale discrimination against any less desirable child. The dynamics involved appear to be similar to those proposed in the studies mentioned above. The source and logic of child preferences is apparently related to the local household system and the guiding principle that individual interests should be subordinated to collective household needs. Thus discriminations made between children relate to their value because of their past, current, or expected contributions to the household.

(Also see a study of the "Effects of child fostering on feeding practices and access to health services in rural **Sierra Leone**" (Bledsoe 1988) for another example of a factor that may lead to discrimination between children in a household.)

The effects of birth order on child nutrition. The birth order of the child may also affect feeding practices, although the extent to which this is true has been debated. A longitudinal study in **Columbia** found that the higher parity (later born) child receives half a month less nursing than the preceding one (Popkin et al. 1983:18). Two studies in **India** showed significant differences in feeding patterns, reporting a parental bias of three to four percent in allocation of food to earlier-born children in the lean season (Behrman 1984b), and a progressive decline in the adequacy of feeding care with later births (Gupta 1986:10).

In one culture an extreme bias in the other direction has been reported. Among the traditional Hausa in **Nigeria** the practice of kunyan dan fari (mothers being shy of their first born) results in young brides concealing their first borns "out of shyness" and delegating them to the care of their mothers until the time of weaning. While the practice is not as widespread as it used to be, 90 out of 250 women interviewed at the hospital in Zaria admitted that they had neither fed nor cared for their first child. The mortality rate among first borns in the Hausa area studied was a very high 31 percent (Cherian 1981:79).

While preferential feeding based on birth order may be related to economic or cultural considerations, the reduced nursing and feeding care that is seen often may be simply due to constraints on mothers' time, especially when the other children are young (Popkin et al. 1983). Availability of older children who can relieve mothers of some of their workload may actually have a positive affect on infant feeding.

The Physical Environment

The physical environment can have a much more complex effect on feeding practices and on the health consequences of alternative behaviors than might be expected. Two important influences will be reviewed briefly here -- the effects of seasonal variations and of differences in water and sanitation quality.

Seasonal variations. Seasonal variations seem to have most impact on infant feeding practices and nutrition in agricultural societies where the crop cycle greatly affects work loads and food availability. The patterns can vary substantially depending on rainfall fluctuations, the types of crops grown, and the intensity of labor that must be invested by women at various points in the planting, growing and harvesting process.

The preharvest rainy season in many areas is a period of intense agricultural work and relative food shortage. There are often critical repercussions on child care and feeding, breastmilk yield and infant health. Both food intake for weanlings and breastmilk yield are one-third less, for example, in one area of **Bangladesh** during the

preharvest monsoon season (Brown et al. 1985 and 1986). Data from **Kenya** show similar variations, with 170-300 milliliters less breastmilk produced in the lean preharvest season (Van Steenberg and Kusin 1981). In **Nigeria** about half the women abruptly wean their infants in the early rainy season, a period when women are needed for intensive work in the field (Serdula et al. 1986). In the rainy season infection and food contamination may be highest, as discussed earlier, just when child care and food preparation and storage standards are at their worst, due to the intensity of farming activities (Barrell & Rowland 1979, Gibbons & Griffiths 1984).

With certain crops, women's activity after the harvest may also be intense. A seasonal decrease in suckling time during this period was observed in **Bangladesh**, for example, due to women's activities related to processing the rice crop (Huffman et al. 1980:150). The post harvest period of relative abundance in most situations, however, is a time of less nutritional hardship.

Water and sanitation. It is generally known, of course, that sanitation and water quality affect the likelihood of preparing safe artificial feeds. One interesting phenomenon that may be useful to examine more closely, however, is the interactive effects of "mothers' milk and sewage" on infant mortality. Analysis of a large set of data for Peninsular **Malaysia** indicates that babies in households with piped water are less likely to die in infancy. Babies in houses without modern toilet sanitation also tend to have higher mortality. More importantly, mortality in both cases is much higher for babies who are not breastfed or who are breastfed only a little (Butz et al. 1981). In the period covered by the data the failure to breastfeed in homes that had no water and sanitation involved twice the risk of dying in later infancy as homes that had both (Habicht et al. 1988).

Earlier the same researchers had concluded that program initiatives to increase breastfeeding would have their greatest impact in reducing infant mortality if focused on populations whose water and sanitation systems were poor (Butz et al. 1981). The investigators eventually concluded, however, that for **Malaysia**, where the population without water and sanitation is relatively small and already has higher breastfeeding rates, the benefit/cost ratio of targeting populations with water and sanitation would be greater because of the much greater proportion of non-breastfed infants in these areas. They still conclude that in poorer countries with a lower prevalence of modern water and sanitation facilities, the policy of targeting programs to encourage breastfeeding in areas where water and sanitation are poor, especially where breastfeeding is short or declining, will save the most lives (Habicht et al. 1988).

Women's Health and Nutrition

A woman's physical state can have an important impact both on milk production and infant feeding and child care behavior, although data show that mothers and their bodies are remarkably adaptive during periods of illness and deprivation

Maternal nutrition and breastmilk volume. Recent studies in the developing world indicate that under normal non-starvation conditions women can produce quantities of breastmilk that are comparable to those of women in western countries. Studies of mothers of exclusively breastfed babies in Texas, for example, indicate breastmilk outputs between 725 ml. and 750 ml. per day for the first four months (Butte et al. 1984). In **Bangladesh** milk volume was found to peak at an average of 750 ml. per day when infants were 5-7 months old (Brown et al. 1986a). A comparison of over 10 studies of infants three months of age showed that in both developed and developing countries women produced similar quantities of milk (Prentice et al. 1986). None-the-less, enhancement of maternal nutrition status may improve milk output to some degree and allow for catch-up growth in low birthweight infants and allow infants to be exclusively breastfed for longer than 4-6 months (Huffman & Combest n.d.:2). Prenatal supplementation also helps prevent low birthweight among women with poor nutritional status.

Maternal nutritional deprivation and infant feeding. In certain areas of the **Kivu region in Zaire**, infant mortality has been found to be higher than in the rest of the territory. It was observed that women breastfed their infants only in the mornings and evenings, leaving them home when they went to the fields. During the day the infants received only boiled manioc, bananas or sorghum and thus deteriorated quickly. When asked why they didn't take their infants with them, mothers pointed to the great distances between their homes and the fields. But within the same ethnic group in other areas there were mothers that routinely carried their infants similar distances and fed them on demand. The distinguishing variable between the two communities was nutritional intake. In the second community researchers found that an average of 80 to 90 percent of energy requirements were met. In the first area, however, women received only 60 to 70 percent of the intake they needed. Saddled with multiple tasks and exhausted, these mothers finally conserved vital energy by leaving their babies at home (Vis et al. 1981).

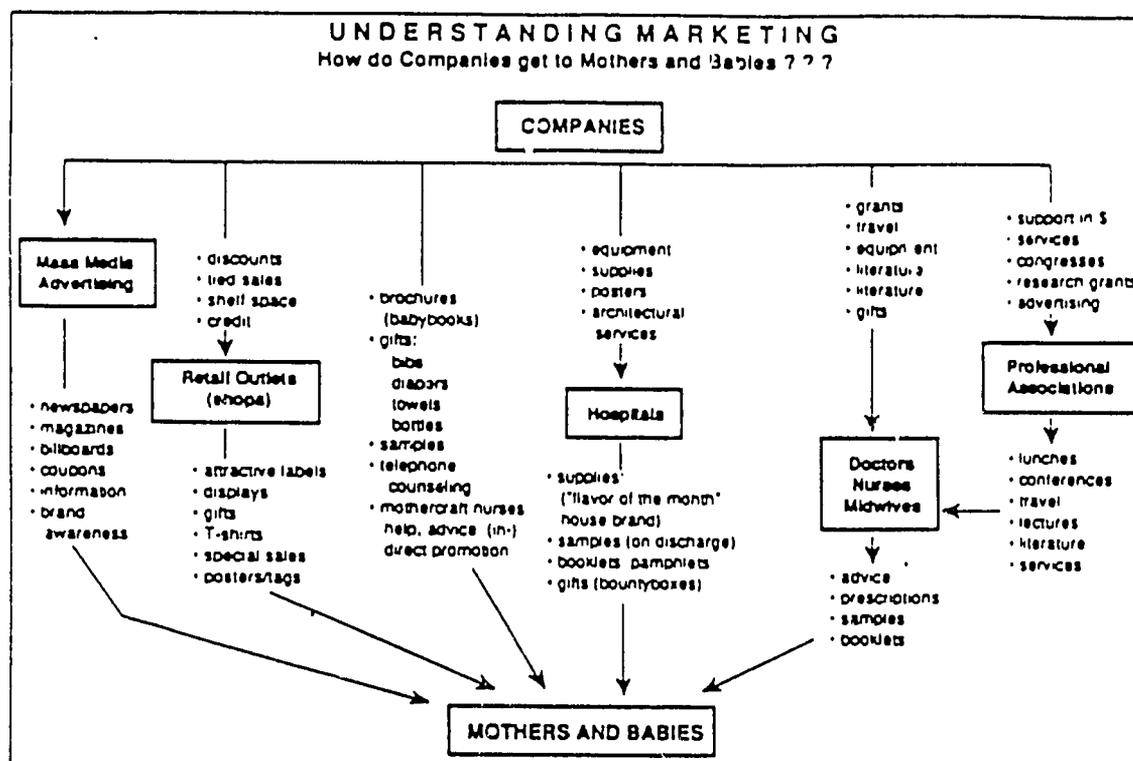
Effects of improving mothers' nutritional status. Efforts to improve the nutritional status of malnourished mothers should lead to some increase in milk production. Supplementation studies focusing on increasing protein or total caloric intake have reported that milk volume can be raised from 15 to 20 percent. The relative benefits to milk production of improving maternal nutrition during pregnancy or different stages of lactation still need to be explored (Brown et al. 1986, Popkin et al. 1983).

An interesting perspective is provided on the issue of maternal nutrition and lactation by a study in **Bombay, India** that estimates that for a mother to buy the additional food she would need to breastfeed would cost 20 rupees per month, while to buy liquid milk for the baby would cost 80 rupees. Powdered milk would cost anywhere from 120 to 160 rupees (Anand 1981b).

The Availability and Promotion of Breastmilk Substitutes

Infant formula companies can attempt to influence mothers' infant feeding decisions in a number of ways. The wide range of marketing channels and techniques that can be used by formula companies in an effort to convince mothers to use their products is shown in Figure 3.

Figure 3: Marketing channels used by infant formula companies



(IBFAN n.d.)

The effects of advertising on mothers' knowledge and practices. Studies of the impact of advertising on mothers' knowledge, attitudes and practices related to infant feeding have been few. One investigation in the Bicol Region in the **Philippines** suggested that the activities of the infant formula companies did not tend to prevent mothers from breastfeeding, but increased the probability of their introducing breastmilk substitutes in the first six months, and thus practicing a mixed feeding approach (Griffin et al. 1984). A detailed investigation of the impact of formula advertising on feeding behavior in **St. Vincent** suggested that the more a mother was influenced by infant food advertising, the sooner she began to bottlefeed and reduce breastfeeding (Greiner and Latham 1982). But, as the authors suggest, the study faced a number of methodological constraints. It was difficult to determine if brand-

name recognition was not simply associated with education and other factors usually linked with earlier supplementation and termination of breastfeeding. Studies with controls for such potentially important socioeconomic factors are likely to be more useful in drawing conclusions (Popkin et al. 1983).

It is quite difficult to separate the impact of infant formula advertising on infant feeding from that of other forces of modernization and change. Breastmilk substitute marketing has had a long history in much of the developing world. In most urban areas commercial milk products for infants have been widely used for at least a generation. It is likely that promotional influences have become assimilated by the culture and are now reflected as common knowledge and attitudes. Since the influence can be quite indirect at times, it is not surprising that investigations often show little association between exposure to advertising and formula use (Marchione and Helsing 1984).

The Population Council's four country infant feeding study found that consumer awareness of formula brand names was high in all sites - even where direct promotion of infant formula to mothers was no longer permitted. The highest recall of commercial advertising was in **Bangkok**, where 83% of the mothers questioned could recall infant formula advertising and the average number of brands recalled was eight! The study determined that one of the three characteristics conducive to bottlefeeding was awareness of the possibility of artificial feeding, including knowledge of specific products marketed for this purpose. The other two characteristics were a high degree of sensibility to the possibility of "insufficient milk" and exposure to the use of artificial milk products, which often occurred through the health services (Winikoff and Laukaran 1989:864).

The availability of substitutes. The availability of breastmilk substitutes is another important factor affecting their use. A study in **Malaysia** found that the greater the number of infant foods available in a community, the shorter on average mothers breastfed. Methodological problems, however, made results difficult to interpret (Butz et al. 1981). The closeness of stores selling infant foods in urban areas, as well as greater exposure to advertising and higher income levels, may be influential factors in increased formula use in cities. Systematic studies still must be completed (Popkin et al. 1983).

The importance of other milk-based products. The possible effects on breastfeeding of the advertising and availability of other milk-based products such as condensed, evaporated and powdered milk should also be investigated. In many communities these are the major breastmilk substitutes, and yet the greatest emphasis thus far has been on the activities of infant formula companies. Distribution of free powdered milk under the Food for Peace Act (P.L. 480) is suggested by many observers to have contributed to breastfeeding decline (Scheper-Hughes 1984, Alvarez 1983, Lechtig et al. 1986).

A useful reference. Readers interested in further exploring the influence of breastmilk substitutes on infant feeding might begin by looking at the excellent discussion of "The Infant Formula and Infant Foods Sector" in "Breastfeeding Determinants in Low Income Countries" (Popkin et al. 1983).

Conclusions and Recommendations

1. The importance of social networks. It is useful to explore who within the mother's social network is most important, both in influencing the feeding choice and providing follow-through support, so that key support groups can be targeted for nutrition education. Mothers, mothers-in-law, husbands, and friends have all been shown to influence mothers' feeding practices, but the individual who most often plays the key role varies among different ethnic groups and cultures. Appropriate education strategies may be specific to particular cultures and target groups. For example, husbands may be reached in some cultures by including them in antenatal classes and consultations with obstetricians, but different strategies may be appropriate elsewhere. If friends are most influential, school-based programs for young mothers or presentations to groups of young women may be helpful. If the mother or mother-in-law offers most support a variety of educational strategies may be necessary, such as (in some cultures) education through women's groups or churches.

2. Effects of urbanization, migration, and social change. As intervention projects seek to identify groups at risk it is important to consider the effects of urbanization, migration, and fragmented social systems. In the developing world, women generally breastfeed less in urban areas than in rural areas in the same countries. Infants in migrating families are particularly at risk for malnutrition, as their mothers adopt the often less desirable feeding practices of their new environments. In societies with poor infrastructure or fragmented social systems mothers also tend to adopt feeding practices less favorable for their infants' health. Strategies should be considered which will offer needed support to these particularly vulnerable groups.

3. The influence of women's work. Groups working to promote breastfeeding and appropriate weaning practices should determine the extent to which women's work is a constraint and which factors are most important locally, so interventions can be strategically targeted. Key factors may include the location of the work, the type of work and its compatibility with child care, alternatives available for child care and feeding, and the relative value of the mothers' time for various activities including breastfeeding. Strategies for addressing constraints will be discussed in the section on "Nutrition Interventions in the Community." Evidence suggests that although mothers who work tend to supplement more, work is clearly not the reason for most early supplementation.

4. Educational intervention. Educational efforts targeted at improving knowledge, attitudes and skills related to infant feeding may have quite beneficial positive effects and should be considered as program activities. Inclusion of infant feeding modules in primary health care programs, as well as in school curricula, may be particularly important in promoting long-term change.

5. Income and artificial milk. Project personnel should explore whether poor families using artificial milk have the resources to purchase enough of the high-priced substitutes to satisfy their infants' nutritional needs. Often feeds are too few or over-diluted, and nutritional status may abruptly decline.

6. Biases related to sex and birth order. Nutrition intervention projects should determine whether there are biases related to sex or birth order in infant feeding patterns within the local culture so that seriously disadvantaged groups can be considered for special targeting. Daughter neglect has been reported to be a particular problem in North India, Pakistan and Bangladesh. Pro-male feeding practices have been reported in other regions as well. Later born children may also receive less feeding care, often because of competing demands on mothers' time. If biases such as these are not investigated, programs may raise the nutrition level of the infant and child population in general without improving the position of these at times severely neglected groups.

7. Seasonal variations. Seasonal variation in food availability, work patterns, breastmilk output, and child feeding practices should be examined, to determine if certain periods of the year carry greater nutritional risk. Data show that in many agricultural societies the pre-harvest rainy season is a time of intense activity, relative food scarcity, and increased contamination and infection levels. Thus it is a particularly hazardous period for both infants and weanlings.

8. Water and sanitation. The interactive effects of water and sanitation with breastfeeding should also be considered, and groups in areas with poorer water supplies and sewage systems targeted in breastfeeding promotion activities, if analysis shows this will save more lives. Results of studies in Malaysia indicate that this is the most effective policy, except in certain areas where the percentage of non-breastfed infants is so much greater in communities with good water and sanitation that concentrating on this group has a higher benefit/cost ratio.

9. Maternal health and nutrition. Nutrition projects should investigate whether problems of maternal health and nutrition are common in the local area and to what extent they affect infant feeding and care. It can then be determined whether interventions to supplement or encourage greater feed intake would be beneficial. Studies have shown that under non-starvation conditions women in developing countries can produce quantities of breastmilk comparable to those of women in developed countries, although enhancement of maternal nutrition may improve output to some degree.

10. The promotion of breastmilk substitutes. Infant formula promotion, both in the maternity ward setting and in the community, should be examined, as false and aggressive advertising and distribution of free samples may encourage mothers to begin mixed feeding earlier. Studies of the impact of promotional activities are somewhat inconclusive due to methodological problems, but certain studies have shown that formula advertising increases the probability that mothers will introduce substitutes in the first few months. Other investigations discovered that the greater the number of infant foods available in a community, the shorter women tended to breastfeed.

IV. Infant and Child Nutrition Interventions in the Community

Issues for Project Design and Implementation

What types of community-level nutrition interventions have been developed to improve infant and child feeding? What alternative approaches have been used, for example, for the design of:

- o Efforts to encourage development of support groups for breastfeeding women
- o Breastfeeding and weaning promotional and educational activities, including face-to-face and mass media approaches
- o Efforts to develop and introduce weaning foods
- o Activities to control infant formula advertising and promotion
- o Other types of legislative initiatives to improve infant feeding

How effective have these strategies been? What lessons can be learned from these experiences to plan more effective interventions?

Support Groups for Breastfeeding Mothers

In an era when traditional support mechanisms for the breastfeeding mother have been dwindling, one useful and quite widespread response to the problem has been the development of community-based support groups for breastfeeding mothers. The movement initially began in the West (with such groups as La Leche League, Ammehjelpen, etc.), the classic model being for women who have successfully breastfed to meet with their peers, supplying them with practical information and emotional support for successfully breastfeeding themselves (Caribbean Food and Nutrition Institute (CFNI) et al. 1982:39).

Support groups in developing countries. More recently, similar activities have been initiated in urban areas of non-Western countries. Currently there are more than 30 breastfeeding support group organizations in 25 countries. For example:

- o In **Nicaragua** Genesis II, an offshoot of the National Women's Organization, is a support group involved in activities such as prenatal classes, promotion through radio, training breastfeeding counselors, offering counseling to mothers, and distributing of a newsletter to professionals in health institutions (Huffman 1984).

- o In **Brazil** the La Leche League helped create mothers' groups in low-income areas through "Legiao Brasileira de Assistencia" (LBA), an organization that runs primary health care units. There are more than 13,000 breastfeeding counseling mothers and 1,500 clubs that concentrate exclusively on breastfeeding. Many other institutions such as the Catholic Church, universities and volunteer groups promote breastfeeding in addition to other activities (CFNI et al. 1982:122).
- o Other groups such as the Breastfeeding Information Groups in **Kenya** and the SuSu Mamas Group in **Papua New Guinea** have worked very actively to promote breastfeeding among working women in their countries.

There have been some interesting variations on this concept, such as establishment of fathers clubs to offer infant feeding support in **Nigeria** and organization of "groupement maternel" in **Haiti** in which women that have fed infants successfully in difficult circumstances ("positive deviants") are paired with mothers who have malnourished children to offer them support and guidance (Alvarez and Heurtelou 1982).

Guidelines for organizing groups. Relatively little research has been done on the effectiveness of these groups. An international conference on "Community Based Support Groups for Breastfeeding Mothers" held in 1982 in **Jamaica** assessed experience thus far and offered useful guidelines for organizing support groups. The Conference suggested that groups can take many forms, such as traditional support groups (traditional birth attendants, doulas, relatives of nursing mothers), self-initiated voluntary associations of mothers, associations started by health professionals, and government-formed support groups initiated through community development agencies or PHC networks. It was proposed that the primary focus in developing countries should be breastfeeding among the urban poor. Groups should know the breastfeeding situation in their local areas well, including practical difficulties faced by mothers, the pattern of malnutrition, local health institution practices affecting breastfeeding, and relevant government policies. Activities suggested for the support groups include:

- o dissemination of information
- o mother-to-mother support
- o training of lactation counselors
- o mass media breastfeeding promotion programs
- o advocacy of legislation to support working women who desire to breastfeed
- o monitoring marketing of breastmilk substitutes
- o reforming hospital breastfeeding practices (in cooperation with concerned health professionals) (CFNI et al.1982:47-48)

Breastfeeding and Weaning Promotion and Education -- Face-to-Face and Mass Media Approaches

Some useful work has been done in recent years, both to introduce breastfeeding and nutrition education into basic school curricula and to develop new approaches to community level education, often combining the use of face-to-face, graphics and mass media communication channels.

Basic educational activities. Efforts have been made to introduce information concerning infant feeding into the curricula of primary and secondary schools, teacher training colleges, and health schools. In **Brazil** and the **Philippines** school curricula include sessions on appropriate feeding and the benefits of breastfeeding (Huffman 1984). In **Papua New Guinea** breastfeeding is part of the curricula for all medical, paramedical and nursing students (Biddulph 1981). In **Kenya** all community health workers (including traditional birth attendants, family health field educators and community-based distributors of contraceptives) receive breastfeeding training (INCS 1987:153).

Do these educational activities produce the desired results? In both **Kenya** and **India** nutrition education associated with primary health care programs has increased the average duration of breastfeeding (Huffman 1984 and Kielman et al. 1978). A promising and initially-successful strategy has been the "Child-to-Child" approach, since older siblings in many countries are responsible for the care and feeding of younger brothers or sisters. Schools in **Mexico** and **Honduras** have tried training children in basic health interventions like oral rehydration therapy with success, and lessons on feeding younger siblings could easily be added (Gibbons and Griffiths 1984:30).

Nutrition education and mass media activities in the community. Quite innovative work has been undertaken recently to develop mass media and social marketing approaches, and the field is still developing. Projects using these techniques have focused on a wide range of child survival interventions. A few of those concentrating in the child nutrition area are described below:

- o **A breastfeeding mass media campaign in Brazil.** In **Brazil** a mass media campaign was launched on television, the radio and in the press as part of a larger breastfeeding promotion effort. Messages were communicated via spots, films, variety shows, day-time women's shows and soap operas, with 600 radio stations and 100 television stations participating. Messages were even included on lottery tickets, telephone bills, electricity and water bills and bank statements. An important strategy in the campaign was to focus on psychological blocks related to breastfeeding. Many of the presentations featured testimonials by prominent breastfeeding women and media personalities who urged others to nurse their children also (INCS 1987:122, Manoff 1982).

- o **A radio course on breastfeeding in Honduras.** The PROALMA breastfeeding campaign in **Honduras** included a radio course. Its development began with an extensive investigation of the target audience and its knowledge and views of breastfeeding. The information was then used in concept development and message formulation and the materials were pretested. A press conference was held and then health professionals in the local health centers encouraged women to participate in the course. Eleven 15-minute programs focused on "Nine Gold Rules," giving simple important information on breastfeeding. An **evaluation** showed that women who answered the course exam did quite well. Analyses of tests turned in to the health centers so women could receive diplomas showed that half answered all questions correctly. Another 36 percent got just one item wrong. The radio course had been organized and undertaken quickly, but showed that campaigns based on behavioral research and integrating three primary channels (graphics, radio and face-to-face communication) could be quite successful (Booth 1985).

- o **A nutrition education strategy to change feeding practices in Indonesia.** In **Indonesia** the Nutrition Communication Behavioral Change Project focused on altering child feeding practices and improving nutrition status through nutrition education without food supplements. During its early stages the project concentrated on training and equipping about 2,000 volunteer village nutrition workers (kaders) and organizing child weighing programs. Major nutrition problems were also identified and then a communication strategy was developed. This stage included an extensive research phase involving focus group discussions, community "self surveys" and household investigations related to weaning food preferences and preparation. Simple messages were then developed. Radio spots were used to support the kaders' basic educational work. In addition, "action posters" were designed and used. (The five- to eight-month poster, for example, reminded mothers to continue breastfeeding and offer the weaning food four times a day, with pictures and space for mothers to check off each time they performed the recommended actions.)

The project **evaluation** indicated that women who participated in the program knew significantly more about feeding practices and served more of the recommended foods than those who didn't participate in the program. After the age of five months, participating children grew significantly better and at 23 months had mean weights almost one kilogram higher than children in the control sample (Manoff 1984, Gibbons and Griffiths 1984:42). Also see recent "Evaluation of the Indonesian Weaning Project" (Zeitlin et al. 1989).

Additional media alternatives for nutrition education. As the examples above illustrate, a variety of media can be employed in nutrition education programs. Groups in developing countries have used TV, radio, booklets, comic books or fotonovellas, bumper stickers, traditional dances, and puppets in educational efforts (E.F.P.Jelliffe 1982). One program in **Haiti** even used political slogans successfully, employing phrases such as "Uproot the Baby Bottle" and "Down with Tetanus, Tetanus

Vaccine for Life" during the recent period of revolutionary fervor. T-shirts and graffiti type posters with these slogans caught people's attention and gave a great boost to CARE-Haiti's child survival project (Puterbaugh 1987).

An excellent guide recently produced by the Nutrition Communication Project, Media Promotion of Breastfeeding: A Decade's Experience, (Green 1989), summarizes experience from over twenty-five countries in the use of media to improve breastfeeding behavior.

Behavioral analysis and positive reinforcement. Some good work is being done in the area of behavioral analysis. Interesting techniques for positive reinforcement have been introduced into child survival programs as a result of earlier stages of this work. In the **Philippines** women were rewarded with polaroid photos of themselves and their babies when they followed desired practices and their children gained weight (Guthrie et al. 1982, Elder forthcoming). In a program in **Tijuana, Mexico**, mothers received lottery tickets for attending the well-baby clinic and for following recommended nutrition practices so their babies would reach weight goals. Drawings were then held each week for three bags of groceries. An **evaluation** showed that after seven months there was a 25 percent average improvement in the weight gain of babies in participating clinics (Elder and Salgado 1988).

Efforts to Improve and Introduce Weaning Foods

Improving weaning foods. Most weaning interventions have concentrated on developing and promoting improved weaning foods. Weaning foods can be improved in several ways, including by:

- o Adding locally-available ingredients to homemade foods
- o Adding one or more "new" ingredients not available locally to a food, with ingredients often packaged and distributed by the project
- o Using pre-mixed or prepared foods that can be served by project personnel or used in local households (Gibbons and Griffiths 1984:21)

The majority of successful weaning food activities have been part of larger projects or programs. Two strategies are possible. The weaning component may be included in a more comprehensive project from the outset, or may be "piggy-backed" onto a project or program that is already underway and functioning effectively. Some of the options that have been tried include adding a weaning component to:

- o Growth monitoring activities
- o Diarrheal disease control
- o Breastfeeding promotion
- o Literacy and adult education
- o Child-to-child education programs

- o Food supplementation and rehabilitation
- o Income generating activities

Each of these options is reviewed thoroughly in the excellent "Information for Action Paper: Program Activities for Improving Weaning Practices" produced by the World Federation of Public Health Associations (Gibbons and Griffiths 1984). Two additional manuals provide useful information on feeding children during the weaning period (Cameron & Hofvander 1983; Mitzner, Scrimshaw and Morgan, editors 1984).

Behavioral research has been quite important, both in helping to determine the need for weaning support activities and in developing acceptable weaning foods and promoting their adoption. A few examples of weaning food components of recent projects and the role behavioral research has played are given below.

- o **The Nutrition Communication and Behavioral Change Project in Indonesia** (described above) focused part of its effort on household investigations to explore local attitudes and ideas about weaning foods and receptivity to possible weaning food recipes. Household investigations focused on a sample of the project's intended beneficiaries, which included pregnant women, nursing mothers and mothers of malnourished children and children with diarrhea. 24-hour dietary recalls were taken. In addition, weaning food recipes were prepared with the mothers using ingredients at hand, fed to the children, and discussed. Return visits offered opportunities for feedback after mothers had attempted to follow the diets.

Investigators found that regional preferences for weaning food preparation varied and thus they focused educational materials accordingly. For example, in all cases a fat source to improve caloric density of the food had to be added, but feedback from the mothers indicated that acceptable methods for doing this varied from one geographic or cultural area to another. While in one area mothers preferred to add oil by frying the tahu or tempe before it was mashed in the porridge, in another region mothers chose to add a small amount of coconut oil to the cooked rice, and in another the ingredients were cooked in coconut milk (Manoff 1984, Gibbons and Griffiths 1984:42-43).

- o **The Sarbottam Pitho Weaning Foods Project in Nepal** began as a supplementary feeding program for mothers and preschool children, with food supplied by the World Food Program. The program was costly, experienced several distribution problems, and created undesirable dependencies. In 1973 a nutrition survey was conducted to identify appropriate local foods and current infant feeding practices. The survey of weaning age children showed that all were breastfeeding but that many were malnourished because they did not receive enough well-balanced supplemental foods. The investigators noticed that almost all mothers knew how to prepare a nutritious and popular traditional snack by roasting and combining a whole pulse such as soybeans or lentils with a cereal grain such as rice, corn or whole wheat. These ingredients were sometimes ground and mixed with milk or water to prepare a gruel for elderly

people. Nutrition workers believed a low cost weaning food could be made in the same way.

After local foods were analyzed a mixture called Sarbottam Pitho was developed. Education on the preparation and use of Sarbottam Pitho was included in an integrated campaign to reduce malnutrition via promotion of nutritious weaning foods, oral rehydration therapy, and growth monitoring. Little data has been collected to assess the impact of the approach, although **evaluations** suggest there have been positive changes associated with the interventions. Some critics feel the Sarbottam Pitho recipe may be too complicated for primary health care workers in remote rural areas to teach and for busy mothers to prepare (Gibbons and Griffiths 1984:35-36).

(Also see the recent report, "Household Observations and Trials, Project for Promotion of Improved Young Child Feeding" by the National Nutrition Council of **Swaziland** (1988), for another excellent illustration of the types of formative research techniques that can be used to develop an effective nutrition education program and examples of recommended changes in feeding practices, including use of improved weaning foods.)

Control of Infant Formula Advertising and Promotion

In May 1981 the World Health Assembly, the governing body of the World Health organization, adopted a Code of Marketing for Breastmilk Substitutes. Supporters of the Code hoped it would convince both governments and the infant formula companies themselves to eliminate some of the most flagrant advertising abuses of the past. Since that time much of the work of breastfeeding groups related to control of breastmilk substitutes has focused on promoting the adoption of the Code, or often stricter versions of it, by their own governments. In **Latin America**, for example, seven countries (as of 1986) had adopted the Code as law and in another five nations codes had been recommended and were awaiting legislation (Lechtig et al. 1986).

Efforts to monitor adherence with the Code have also been organized in a number of countries. The A.I.D.-supported investigation undertaken by the Population Council for the Infant Feeding Study (1984) (Winikoff 1989) in **Bangkok, Bogota, Nairobi, and Semarang** attempted to document changes in the marketing of infant foods since the WHO Code was adopted. Investigators report five important trends:

1. An increased amount of price competition;
2. Increased product availability, with infant formula readily available in every category of retail outlet used by consumers;
3. Discontinuance of consumer-oriented mass media advertising;
4. Extensive promotion of commercial infant foods to health care workers, and through them, to consumers; and
5. Continued distribution of infant formula samples to mothers, directly or indirectly, many of whom live in high risk environments.

Other reports also indicate that while advertising techniques have changed, promotion is still intensive in many areas, in some places with obvious abuse. In **Kenya**, for example, the Cerelac label in Swahili recommends its use at three months. Sugared "infant teas" are being promoted aggressively in many countries. One manufacturer, Milupa, promotes its infant teas "from the first week of life" (CMC 1986). A report from **South Africa** details many methods of indirect advertising by companies, such as promotion through supermarket sales, displays in stores, advertisement of specials in the papers. Promotion through the clinics continues there as well, with milk company representatives still allowed to present "health talks" to waiting mothers, during which breastfeeding is superficially supported but major emphasis is placed on the variety of other products that are "just as good" when breastmilk supplies fail (Thorton 1984).

Little systematic research has been conducted on the effects that regulation of the formula industry can have on infant feeding practices. One noteworthy intervention was made in **Papua New Guinea**. There the Baby Feed Supplies (Control) Act of 1977 closely controlled the sale of feeding bottles, nipples, and pacifiers, which can now only be purchased with a prescription from a registered health worker. The worker must first make an investigation to determine if artificial feeding is in the baby's best interest and provide the mother with education on safe techniques for bottlefeeding. In addition to controlling the sale of feeding supplies, the advertising of bottles and breastmilk substitutes on the radio was outlawed and breastfeeding was extensively promoted, both in schools and health institutions. Although it is hard to determine exactly what the specific effects of the different aspects of the initiative are, it is quite evident that the act focused the community's attention on the dangers inherent in bottlefeeding without proper precautions and has substantially increased awareness of the problem. A study of breastfeeding prevalence in the capital city of **Port Moresby** before and after adoption of this strong set of policies indicated that, while in 1976 65 percent of children under two were breastfed, in 1979 prevalence had increased to 88 percent. There appeared to be no evidence that bottles had become a thriving black market commodity, as some gloomy onlookers had predicted (Biddulph 1981).

Other Legislation to Improve Infant Feeding

Other legislative initiatives, many of them focused on providing support for the breastfeeding working mother, may be of help in increasing breastfeeding duration. International Labor Organization (ILO) policy promotes maternity protection in industrial and commercial employment establishments and nonindustrial and agricultural settings as well. Current ILO policies state that women should have the minimal protection of allowable maternity leave for from 6 to 12 weeks and that two nursing breaks of one-half hour each should be allowed per day. The organization of creches or nurseries either within or next to employment sites are also recommended to enable women to breastfeed while on the job. However, the obligation to provide these facilities is only for employers with a minimum number of female employees (generally from 10 to 100).

Some countries such as **India, Sri Lanka, Tunisia, Haiti, and Tanzania** have specific provisions for nursing breaks or creches, but many countries have none (Huffman 1984). In many developing countries the proportion of women working in the formal sector is small and thus legislation is unlikely to help many of them. In certain countries, such as **Brazil, Chile, Colombia, Peru and Mexico** more than two-thirds of the mothers are entering the formal and informal labor force, most of them working outside the home. More stringent measures to protect leave and facilitate breastfeeding at work are needed in these situations (Lechtig et al. 1986).

Enforcement of existing laws has had impressive results in some places. In the state of Santa Catarina, **Brazil**, a 1979 study estimated that less than ten percent of the industries with more than 30 employees had creches, although it was required by law. Just one year after the government began requiring registration of creches and instituted special inspections, 85 percent of the employers had creches and 60 percent of nursing women at these work places were using them (Huffman 1984:179). In some cases, however, laws that place the financial burden for maternity benefits on companies may discourage them from hiring women likely to have children. In **Malaysia**, for example, the electronics industry will not employ married women and even requires them to resign upon marriage so that costly maternity benefits due by law will be avoided (Van Esterik and Greiner 1981).

The effects adoption or enforcement of stricter laws to protect the breastfeeding working woman may have on infant feeding practices need systematic study. Results could help guide policy decisions concerning the emphasis that should be placed on legislative initiatives of this type.

Conclusions and Recommendations

1. Development of community-based breastfeeding support groups. Projects and community groups should consider the possibility of encouraging the development of support groups for breastfeeding mothers, as they can have a substantial impact in the community. In countries where these groups are active they have done impressive work in the area of providing mother-to-mother support, training breastfeeding counselors, initiating mass media campaigns, monitoring marketing of breastmilk substitutes, and exerting pressure for needed changes in legislation and hospital feeding practices.

2. Promotion of better weaning practices and foods. Initiatives to introduce new or improved weaning foods should be explored, with care taken to analyze behavioral tasks so that changes in food preparation proposed will be both possible and probable, given time constraints, local preferences and the availability of ingredients. If new weaning foods are being introduced, for example, it is important to determine what mothers must do to prepare them, whether the necessary ingredients, utensils and fuels are available, and whether recipes or

mixtures are locally-acceptable. The Nutrition Education and Behavioral Change Project in **Indonesia** was particularly successful in developing effective methods for investigating the cultural and behavioral aspects of promoting change in nutrition practices.

3. Use of multiple communication channels. Nutrition education interventions should employ all the media channels that are relevant and affordable. Mass media approaches are often most successful when coordinated with solid face-to-face nutrition education strategies.

4. Control of infant formula companies and products. Health personnel concerned with the negative effects infant formula promotion may have on infant feeding practices should consider the feasibility of adopting and enforcing stricter breastmilk substitute codes regulating the access of formula companies and products in health care institutions. Even following the adoption of the WHO Code of Marketing for Breastmilk Substitutes abuses by the infant formula industry are still widespread in many countries. Legislation of stricter codes and more diligent monitoring may help. Many free market economies would have difficulties adopting such policies, but a stringent set of initiatives in **Papua New Guinea** to closely regulate the sale of feeding bottles and prohibit advertising of breastmilk substitute products appears to have played a major role in increasing breastfeeding prevalence there.

V. Infant and Child Nutrition Interventions in Health Institutions

Issues for Project Design and Implementation

What types of institutional interventions have been attempted to improve health workers' knowledge about infant feeding and change detrimental policies and procedures? What alternative strategies have been used, for example, for the design of:

- o Training programs for health personnel on infant feeding and lactation management
- o Changes in hospital policies and procedures
- o Control of infant formula promotion and use in the institutional setting
- o Activities to share infant feeding information and encourage utilization of relevant findings

How effective have these strategies been? What lessons can be learned from these experiences to plan more effective interventions?

Practices and Procedures that Promote and Protect Breastfeeding

The World Health Organization has recently published an excellent guide that outlines the practices and procedures that facilities providing maternity services and care for newborn infants should follow to promote successful breastfeeding. The most important steps, many of which have been discussed earlier in this review, are summarized in the beginning of the document. (See Figure 4.)

Developing Training Programs for Health Personnel

Once the policies and procedures detrimental to breastfeeding in an institution have been adequately explored and administrative support for desired changes obtained, development of appropriate training programs for health personnel is usually the wisest next step. Training, when combined with appropriate institutional changes, can have a substantial impact on mothers' feeding practices and thus on child survival.

Figure 3: Steps to successful breastfeeding in maternity services



Ten steps to successful breast-feeding

Every facility providing maternity services and care for newborn infants should:

1. Have a written breast-feeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breast-feeding.
4. Help mothers initiate breast-feeding within a half-hour of birth.
5. Show mothers how to breast-feed, and how to maintain lactation even if they should be separated from their infants.
6. Give newborn infants no food or drink other than breast milk, unless *medically* indicated.
7. Practise rooming-in – allow mothers and infants to remain together – 24 hours a day.
8. Encourage breast-feeding on demand.
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breast-feeding infants.
10. Foster the establishment of breast-feeding support groups and refer mothers to them on discharge from the hospital or clinic.

(WHO 1989)

Training programs and their results. The training activities undertaken by a number of developing country institutions have been impressive.

- o **PROALMA's training strategies and their results.** PROALMA, the urban breastfeeding project in **Honduras**, focused its efforts on altering health professionals' knowledge and attitudes about breastfeeding, as well as changing detrimental hospital policies and practices. Based in three major hospitals, project personnel provide both on-the-job assistance to staff members and give formal training to physicians, midwives and nurses on breastfeeding management. **Surveys** before and after implementation of the project showed that the proportion of health professionals recommending that women initiate breastfeeding at birth increased from less than 40 percent to over 75 percent. The percentage of physicians recommending breastfeeding on demand increased from 46 to 68 percent and the percentage of nurses, from 33 to 90 percent. The second survey indicated that nearly 80 percent of the respondents had received some formal training by the PROALMA staff through courses, colloquia or seminars (Mothers and Children 1987, INCS 1987, O'Gara 1984). (Also see recent evaluation by Popkin, Bailey & O'Gara 1989 and case study by Huffman & Panagides, 1990.)

- o **The "multiplier effects" of breastfeeding training in Brazil.** The work of an extremely active breastfeeding program in **Brazil** illustrates the impressive multiplying effects that strategically planned training activities can have. Intensive training sessions for health professionals were organized at the state level, focused on informing physicians and nurses about the advantages of breastfeeding and techniques of lactation management. Participants were then expected to train colleagues in their home institutions. Physicians taught nurses, who trained auxiliary nurses, who trained other health personnel, including traditional birth attendants. During the first three year period, between 100 - 150 seminars and training symposia were held and 12,300 health professionals were trained, as well as 15,000 auxiliary nurses, attendants and other interested persons. 19,000 community leaders of the Ministry of Education and 6,000 community leaders of the Ministry of Interior received instruction as well, and breastfeeding was incorporated into the curricula of 32 medical and nursing schools (INCS 1987 and Marin 1988:157).

Well-conceived programs to "train trainers" on an international basis have in some cases had wide spread impact. Particularly noteworthy has been the International Lactation Management Education Program developed by Wellstart in **San Diego**:

- o **The International Lactation Management Education Program at Wellstart, San Diego.** With support from A.I.D. and the International Nutrition Communication Service, Wellstart (formerly known as the San Diego Lactation Program) began offering education in breastfeeding and lactation management to physician nurse teams from developing countries in 1983. The courses,

which prepare professionals to develop lactation education programs in their own hospitals and countries, have educated over 220 professionals from 21 countries. Wellstart graduates have been very active teachers. Graduates from institutions in **Thailand**, for example, returned home to organize training for over 1000 health professionals in nine workshops and four intensive courses. This led to additional secondary training and policy changes in eight major **Bangkok** hospitals. The director and key staff members of the **Honduras** PROALMA project also received training through the Wellstart courses. Several aspects of the Wellstart program appear to be particularly important to its success:

- 1) Institutions sending personnel for training are encouraged to send a multi-disciplinary team, usually including a pediatrician, obstetrician, perinatal nurse, and nutritionist who can work together to train colleagues and promote hospital and community changes.
- 2) Training is very practical in nature, including many activities during which participants learn by observing and practicing new techniques in real health care settings. The teams also develop action plans for organizing model teaching and service programs on return home.
- 3) The participants are provided with a basic collection of teaching materials for use in their own programs.
- 4) All teams are provided with on-going technical support in their own institutions, including receipt of periodic newsletters and monthly reprints from current literature and continuing education and motivation through follow-up visits (Wellstart 1987, Naylor and Wester 1986).
- 5) Teams include some senior staff and administrators who have the power to change policies and procedures on return to their institutions.

Recently Wellstart provider teams that have included Ministry of Health officials and hospital administrators have developed plans to set up national lactation education and training centers in several countries. For example:

- o The Government of the **Philippines**, for example, has prepared plans to use Dr. Jose Fabella Memorial Hospital as a National Center to "train trainers" of provider teams and community workers from all regions of the country in lactation management and breastfeeding promotion.
- o The Royal Government of **Thailand** has given its support for a National Center at Siriraj Medical School and a program of lactation training that will eventually reach all health provider teams in hospital and maternity centers in the country and the over three hundred thousand village volunteers working at the community level.

Changing Hospital Policies and Procedures

Well-planned changes in hospital policies and procedures have been made in a number of institutions, often with impressive results. For example:

- o **The Bangkok Breastfeeding Promotion Project.** The Bangkok Breastfeeding Promotion Project was designed to promote breastfeeding-related institutional changes in 8 of the major hospitals where 70 percent of all births in **Bangkok** take place. Seventy-five professionals from participating hospitals that attended three-week long workshops were then asked to serve as lactation management trainers for other colleagues that did not attend and to develop goals for improving feeding practices at their hospitals. Changes made at various participating institutions were quite impressive, including:
 - o Abolishing new-born nurseries except for babies with complications
 - o Discontinuing prelacteal and regular formula feeds
 - o Giving nurses specific responsibilities for breastfeeding promotion
 - o Reducing mother-infant separation to four to six hours
 - o Establishing rotating milk banks
 - o Prohibiting privately purchased bottles in the hospital
 - o Establishing programs to support breastfeeding mothers, including counseling, a lactation clinic, and educational activities

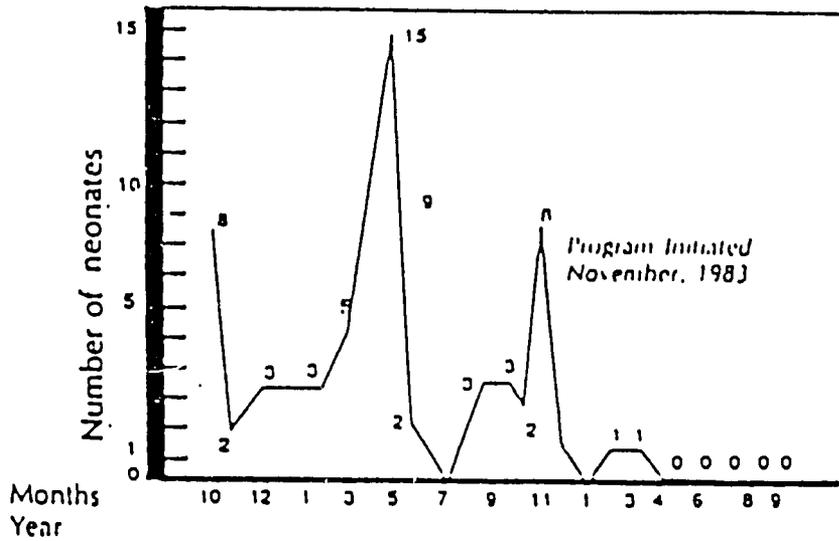
A 1986 project evaluation, which documented these institutional changes in detail, reported a significant increase in the incidence and duration of breastfeeding. (Durongdej et al. 1986)

- o **Dr. Kariadi Hospital, Semarang, Indonesia.** Graduates of the Wellstart program at the Dr. Kariadi Hospital in Semarang, Indonesia began an intensified breastfeeding program in their hospital in November of 1983. As the chart in Figure 5 shows, after initiation of the program there was a dramatic reduction in neonatal diarrhea.
- o **Bagio General Hospital, Bagio, Philippines.** The Baguio General Hospital and Medical Center in the **Philippines** until 1975 separated babies from mothers at birth, gave cows' milk often before mothers had a chance to breastfeed, and cared for infants in traditional type nurseries usually separated from the maternity wards. A campaign to change infant feeding policies began with efforts to convince hospital administrators of the wisdom of proposed new approaches, and then followed with sensitization and training of physicians and nursery staff. Eventually babies were given to their mothers within minutes of their births, prelacteal feeding was discontinued, and immediate and frequent suckling encouraged. Rooming-in was increased from 48.9 to 92.7 percent.

Figure 5: Results of an intensified breastfeeding program at Dr. Kariadi Hospital, Semarang, Indonesia

DECREASED MORBIDITY & MORTALITY IN INDONESIA

Wellstart graduates at Dr. Kariadi Hospital in Semarang report a dramatic reduction in neonatal diarrhea:



Number of neonates with diarrhea before & after initiation of an intensified breastfeeding program

(Wellstart 1988)

The effects these changes had on child health and survival were quite remarkable. A **comparison of nursery charts** in 1973 and 1977 showed a dramatic decrease in mortality and morbidity strongly correlated with the mode of feeding and rooming-in. Breastfeeding of babies increased from 40.7 to 87.7 percent. Incidence of diarrhea had been 27.5 per 1000 newborns, but decreased to only 1.5 per 1000. Mortality had been 8.05 per 1000 due to diarrhea but in the second period was non-existent. Newborns with clinical signs of sepsis dropped 88.64 percent after procedures were changed, and only 3.06 percent of the septic cases were among breastfed babies (Relucio-Clavano 1982, Clavano 1982).

- o **Sanglah Hospital, Denpasar, Indonesia.** Clinical data on newborn babies at Sanglah Hospital in Denpasar showed an impressive difference before and after initiation of rooming-in, as well, both in morbidity due to conditions such as acute otitis media, diarrhea, neonatal sepsis and meningitis and mortality due to infection, as Figure 6 illustrates.
- o **Dr. Jose Fabella Memorial Hospital, Manila, Philippines.** Fabella Hospital, the largest maternity hospital in Manila, with 80 to a 100 deliveries a day, has made most of the changes described in the examples above in its impressive rooming-in program. A few of the innovative aspects of its program include:
 - 1) Placement of "Star Awards" on the beds of mothers who are already lactating. Beds without stars are signals to the medical and nursing staff to assist the mothers in them to successfully initiate breastfeeding.
 - 2) Confiscation of any bottles seen on the wards, along with intensified breastfeeding education.
 - 3) Little or no use of formula in the entire hospital, with reliance on an in-hospital "mini" breastmilk collection, storage and distribution system.
 - 4) A policy of "no discharge without lactation", based on the premise that failure to lactate can be as deadly as many diseases to newborns in the poor and unsanitary conditions in which most of them will live (Gonzales 1988)

Figure 6: Decreased morbidity and mortality due to rooming-in at Sanglah Hospital, Denpasar, Indonesia.

	6 months before rooming-in	6 months after rooming-in
CLINIC DATA ON NEWBORN BABIES AT SANGLAH HOSPITAL		
November 1, 1984 - October 31, 1985		
Total births:	1,917.0	2,011.0
Morbidity (per 1000 births)		
Acute otitis media	106.9	8.4
Diarrhea	40.2	5.5
Neonatal sepsis	31.8	8.4
Meningitis	13.0	1.9
Mortality (per 1000 births)		
Infection	21.4	8.0
Non-infection	30.2	25.4
(Wellstart 1988, Soetjiningsih et al. 1986)		

Recently the Medical Director at Fabella calculated what it would cost him if he were to reconvert from total rooming-in to full-scale nursery care at his hospital. The costs, now saved and used for other purposes, as Figure 7 indicates, are impressive:

Figure 7: Cost Savings from Rooming-in at Jose Fabella Memorial Hospital, Manila, Philippines

NURSERY COST SAVINGS FROM ROOMING-IN AND BREASTFEEDING JOSE FABELLA MEMORIAL HOSPITAL			
Feeding Bottle Sets/Year -	124,800 x P20.00	=	<u>P 2,496,000</u>
Milk Formula Cans/Year -	17,521 x P36.00	=	<u>630, 720</u>
Salary of Nursing Staff/Year -	90 x P3,000 x 12	=	<u>3,240,000</u>
Salary of Formula Room Staff/Year -	6 x P2,000.00 x 12	=	<u>144,000</u>
TOTAL (8% of the hospital budget)			<u>P 6,510,720</u> (S310,034)
<u>Not Included:</u> Cost of electricity; Cost of water; Cost of detergents; Cost of diapers; Cost of bassinets			
THE SAVINGS OF 8% OF HOSPITAL BUDGET IS NOW CONVERTED INTO:			
1.	Availability of drugs and medicines at all times		
2.	Improved food and nourishment for patients		
3.	Availability of blood in times of emergency		
4.	Fresh linens and gowns for patients		
5.	Additional nursing staff to attend to patients		

(Gonzales 1989 (presentation) and Naylor 1989)

Controlling Infant Formula Promotion and Use

Measures to control infant formula promotion and use. Institutions following the policies and procedures described above have in many cases attempted to control infant formula promotion and use as well. Since the changes are usually undertaken in concert with other interventions, it is difficult to determine their specific effects. The government of **Papua New Guinea**, for example, banned the use of feeding bottles in hospitals and health centers and curtailed formula company advertising, while instituting other stringent controls (Biddulph 1981). The director of Bagio General Hospital in the **Philippines** "closed the doors of the nursery to the milk companies," eliminating their posters and calendars and refusing all samples and donations. At the same time he stopped giving infants a starter dose of infant formula and strongly encouraged hospital employees to breastfeed (Relucio-Clavano 1981). The interventions in each of these sites, as described earlier, had significant effects on infant feeding practices. It is impossible, however, to determine the relative importance of formula control policies compared to the other changes made.

Measurement of the effects of distribution of formula samples. One experiment in a **Canadian** hospital was designed to provide information concerning the specific effects of infant formula promotion. The results illustrate the possible influence of such seemingly innocuous procedures as distribution of free samples:

- o A "randomized controlled clinical trial" designed to measure the effects of distribution of formula samples on mothers' breastfeeding behavior was conducted in **Montreal** General Hospital. 448 breastfeeding mothers were randomly assigned either to receive or not receive formula sample packets on discharge from a maternity ward. These mothers, unaware of the study, were then telephoned three months later by a research assistant who was not told of the group assignments of those he interviewed. "Sample" mothers were less likely to be breastfeeding at one month (78 percent versus 84 percent) and were more likely to have introduced solid foods by two months (18 percent versus 10 percent). These trends became more significant in three groups with higher risk status: less educated mothers, first time mothers, and mothers who had been ill post partum. The authors predict that effects would be greater in developing countries where mothers are less educated and less healthy (but suggest that further research is needed) (Bergevin et al. 1983).

Sharing Information and Promoting the Use of Findings

A lack of coordinated information sharing and effective dissemination and utilization of program findings is a common problem throughout the world. Illustrating the difficulty in just one country, Manoff observed:

In **Brazil**, few members of the National Working Group responsible for the national breastfeeding program were aware of the successful experience with rooming-in in Recife. Several were unaware of the Santa Catarina experience in setting up work-place creches. No more than 10% of the health professionals we addressed in five different cities even knew about the new WHO/UNICEF International Code for the Marketing of Breast Milk Substitutes even though Brazil voted for it at the 1981 World Health Assembly. If educators are to be effective with the public, they must be adequately informed for their jobs (Manoff 1982:4).

Effective information sharing, coupled with well-designed strategies for promoting the use of that information, is an important, although often forgotten, tool for change.

Systems for information sharing. A number of well-organized and responsive systems for information sharing have been developed in the area of infant and child nutrition, both at an international and country or institutional level:

- o The Clearinghouse on Infant Feeding and Maternal Nutrition at the American Public Health Association, for example, has been providing information to a wide-ranging audience since 1979. Users include developing country health providers, non-governmental organizations and policy makers, as well as a variety of other groups. Over 3000 information requests are processed a year (INCS 1987:114). Use of an automated database system gives the clearinghouse the capability to respond quickly to specific information needs. An informative Bulletin on Infant Feeding and Maternal Nutrition: Mothers and Children is published three times a year in English, Spanish and French and distributed free to health professionals, nutritionists, and governments in third world countries.

- o The PROALMA Breastfeeding Promotion Program in **Honduras** also established a clearinghouse for information about breastfeeding. During its pilot phase, the project collected and catalogued over 500 documents, many in Spanish. The documents have been consulted by numerous health students and professionals, and journal articles distributed to over 1,000 physicians and nurses (INCS 1987:135)

- o Wellstart in **San Diego** has a large collection of materials related to infant feeding, including professional textbooks, project reports, reprints (organized on a computerized data base), slides, films and videotapes. Health professionals attending Wellstart's international lactation management courses are encouraged to select a comprehensive set of both slides and written materials for use in their own institutions. After they return, Wellstart sends them reprints on current topics each month, as well as a newsletter which shares information on the activities and research of program graduates (Wellstart 1987, INCS 1987:164).

Methods for promoting utilization of results. Involvement of community and program decision makers, even as early as the "problem identification" stage of research development, is key to creating a sense of commitment to project results. Administrators and health program personnel can be involved throughout the research, often playing important key roles as advisors, informants, data collectors, and project monitors. Quite a useful end-of-project strategy is to organize workshops for key decision makers. Results can be presented in formats most practical for operating personnel. Then attendees can be asked to determine what changes are indicated by the research and draft plans of action. The International Development Research Centre (IDRC) routinely sets aside funds that can be used to sponsor workshops of this type. When an excellent IDRC research project on weaning methods was completed in Mali, for example, key personnel from the health ministry, health training institutions, and health service organizations gathered to review results and determine what changes should be made in training and health service programs (Diarra et al. 1986).

Conclusions and Recommendations

1. Training in lactation management. Systematic training of health institution personnel in lactation management and other aspects of infant feeding should be included in all attempts to make major institutional changes that will increase child survival. Well-directed training activities have had widespread impact in such programs as PROALMA in Honduras and the Breastfeeding Promotion Project in Brazil. Coverage can be multiplied if trainees are successfully encouraged to train others in their home settings. The Wellstart program, which has trained a number of teams from developing country institutions in lactation management, has found several things to be key to program success, including:

- 1) Focusing on multi-disciplinary teams with some senior administrators strategically placed in their home institutions
- 2) Providing scientifically-based, practical training with an emphasis on developing action plans for training and policy changes in home institutions
- 3) Providing participants with a basic collection of teaching materials for use in their own programs
- 4) Offering well-timed follow-up support through in-country visits, newsletters and reprints.

2. Changes in health institution procedures. Health institution procedures shown to be associated with substantial increases in breastfeeding incidence and duration, and thus with decreased infant morbidity and mortality, should be adopted in all countries where infant mortality is high. These procedures include eliminating unnecessary use of anesthesia during childbirth, discontinuing prelacteal feeds, encouraging early contact and suckling, supporting feeding on demand, instituting rooming-in arrangements, and establishing human milk banks.

3. Control of infant formula. Measures to control infant formula promotion and use in hospitals, clinics and maternity centers should also be considered. It has been difficult to document the specific effects of institutional promotion and use of breastmilk substitutes on feeding practices, although most authorities consider them to be important. Specific interventions that could be considered include banning the advertisement and distribution of formula company products within the institutional setting and curtailing use of breastmilk substitutes except when medically indicated.

4. Sharing information and utilizing results. Strategies for sharing important information on infant feeding and promoting effective utilization of relevant research results should be developed by health service institutions. Often programs within the same country or region involved in making innovative changes are unaware of each others efforts. Development of local libraries,

clearinghouses, newsletters, and systems for sharing recent literature in the infant nutrition field are a few of the strategies that may be beneficial. Community leaders and decision makers should be integrally involved in research, even at the problem identification stage, and asked to review relevant findings and develop specific plans for their utilization.

VI. Sustaining and Expanding Nutrition Programs

Issues for Project Design and Implementation

Are donor supported interventions continued successfully after original project or program activities have ended? What problems have been encountered in sustaining activities, and how have they been overcome?

How successful have efforts been to expand pilot or community-level projects to a larger scale? What problems are typical and how can they be addressed?

Sustaining Nutrition Improvement Activities

A critical factor limiting the impact of many successful nutrition improvement endeavors is their inability to develop viable strategies for sustaining the achievements over time. As Hornik (1985:69) observes in a review of approaches to evaluating breastfeeding campaigns:

The tougher questions address what will have to be done if the program is to continue beyond the nine-month pilot phase, when UNICEF and USAID funds and technical assistance support is gone and when the special budgetary allocation disappears from the Ministry of Health budget. Is there evidence of a long-term solution to the problems of maintaining contact with the field or keeping existing field workers doing the home visits the program demands? The evaluator will be looking for evidence that local talent will have the resources to maintain the activity. It will involve comparing project budget and staffing commitments to current levels of activity. It would ask about the nature of incentives which will keep the field workers doing their jobs when the novelty is over.

Budget problems. Budgetary considerations, of course, are critical. Some program activities actually result in substantial savings, such as many of the procedural changes adopted by hospitals to encourage breastfeeding (e.g., eliminating prelacteal feeds, encouraging rooming-in and limiting in-house formula use). In addition to cutting the costs for bottles, artificial milk supplies, and staff time in nursery care, secondary savings in drugs and staff time are realized as infection and general morbidity rates decrease. Many nutrition projects, however, have substantial recurring costs that must be met as donor support ends. Institutionalizing local support has been a common problem that must be considered as early as the project design stage.

Combining training with concrete changes. Other considerations, in addition to those of on-going budgetary support, are important if changes are to remain over time. At the institutional level, training activities are likely to have little long-term effect unless they are supported by changes in the hospital and health center environment that reinforce new practices (Hornik 1985). Evidence from many of the projects examined above suggests that well-coordinated efforts focusing on training and institutional or legislative change are often most successful over the long run.

Strategies for planned changes. It appears that there are three important stages in the process of changing complex organizations such as a hospital. These include (Hales 1981):

- 1) Unfreezing: creating a motivation to change
- 2) Changing: developing new responses based on new information
- 3) Refreezing: stabilizing and integrating change

The steps proposed for a successful change process in Hales' excellent article are worth examining. The institutionalizing or "refreezing" phase is often one of the most difficult, as change must be successfully linked to the organization's parts and integrated as part of standard operating procedures (Hales 1981).

Multi-disciplinary and inter-sectoral approaches. Many health planners have stressed the need for multi-disciplinary and inter-sectoral approaches at the health institution and community or national levels. Groups that are most successful have usually worked with health professionals from all disciplines with jurisdiction over the infant nutrition problem. Large-scale initiatives may involve inter-ministerial task forces, with representatives from professional societies, health training institutions and donors as well (INCS 1987:117).

Linking nutrition activities with other child survival initiatives. It is often wise to link nutrition improvement activities with other initiatives in the area of child survival or primary health care. A breastfeeding promotion campaign, for example, can be integrated with other activities such as growth monitoring or diarrheal disease control. An effort to encourage preparation of nutritious weaning foods can be inserted as one component in an agricultural extension project or a larger scale primary health care program.

Expanding Nutrition Improvement Programs

Multiplier effects. Successful activities, if properly publicized, often have important "spin-off" effects in other institutions and regions. A project that began as an effort to make changes conducive to breastfeeding in one **Bombay** hospital quickly expanded, for example, because:

- 1) its pediatric department supervised postpartum care of babies in five other maternity hospitals where they made similar policy changes,
- 2) many medical students did clinical work at the hospital and later taught in nursing colleges, and
- 3) the hospital director served as consultant and gave addresses in numerous other institutions (Anand 1981b).

Training activities, as seen earlier, can have quite widespread effects if core training teams are chosen wisely and given the knowledge, support and incentives necessary to train others in their home institutions and communities (Durongdej et al. 1986, INCS 1987).

Difficulties in expanding small projects. Small-scale pilot or demonstration projects often run into major difficulties when the decision is made to "go to scale" or institutionalize the activities at a wider level. Pyle (1981a and b) has provided an insightful analysis of nutrition interventions and the problems associated with expanding to national level programs. After studying seven small-scale nutrition projects in one state in India, he identified certain common factors that helped them succeed, including:

- 1) an orientation toward results rather than procedures,
- 2) good staff morale,
- 3) both the staff and community being accountable for their actions,
- 4) a flexibility to respond to special needs and situation, and
- 5) extensive community participation.

As the projects were expanded to large-scale government operations they often lost much of their initial enthusiasm and impact. A close examination of the problem indicated that:

- 1) programs had become procedure-oriented rather than results-oriented,
- 2) there was typically a lack of motivation on the part of the staff with little chance for promotion and no worker or community participation in program management,
- 3) administration was usually centralized and highly hierarchical, and
- 4) vested interests often had become entrenched with lack of accountability and corruption common (Pyle 1981a and b).

As this analysis suggests, program designers and policy decision makers must be aware of the constraints facing them during efforts to expand. It is critical to focus on what makes interventions effective and how typical behavioral, organizational, and often political problems can be addressed when "going to scale."

Conclusions and Recommendations

1. Sustaining and institutionalizing changes. It is essential to consider early on how activities will be supported when initial funds run out, and what strategies are necessary to effectively institutionalize important changes. Long-term viability is not seriously enough addressed in either project design or implementation. Budgetary issues are critical and need to be considered even as early as the design phase. Training activities are often most successful if they are combined with procedural and legislative changes that support the new practices being proposed. Interdisciplinary approaches with participation of a well-considered range of governmental, professional and academic institutions are often important to the success of more complex interventions. It is usually desirable to integrate nutrition improvement with larger child survival or primary health care initiatives.

2. Expanding small-scale projects. Since small-scale pilot or demonstration projects often run into major difficulties when the decision is made to expand, project designers and managers should consider carefully the behavioral, organizational and often political factors that are essential to success. Difficulties often encountered during the expansion phase indicate the importance of 1) orienting of activities toward results rather than procedures, 2) developing good staff morale and systems for accountability, 3) maintaining flexibility when responding to special needs and situations, and 4) encouraging extensive community participation. Mechanisms for maintaining these important program characteristics must be devised, but become a difficult challenge as small-scale projects are integrated into larger bureaucracies.

VII. Methods for Studying Behavior Related to Infant Feeding

Issues for Project Design and Implementation

What qualitative research methodologies are useful in obtaining information for designing and evaluating interventions in the areas of breastfeeding, weaning and nutrition?

An Overview

In recent years experimentation with the use of qualitative research techniques in the area of nutrition and infant feeding has accelerated. Certain of the techniques have long been used in academic circles, but have been adapted and fine-tuned to address very practical questions related to child survival. In some cases quite innovative approaches have been developed. Often these methodologies have contributed insights that have been critical to the design of effective interventions.

A large number of informative documents on qualitative methodologies useful both in nutrition improvement and for child survival interventions in general have been collected during this review of the behavioral issues in child survival programs. The goals of the current analysis did not include a detailed review of methodology, but it is important to at least provide a brief review of some of the useful methodologies being employed at the project level. The review is necessarily illustrative rather than comprehensive. Further detailed examination of the methodologies and their potential contributions should be carried out.

Guides for Community Nutrition Assessment and Diagnosis.

A number of useful guides for community nutrition assessment in the developing country context have been designed and field tested in the past few years. For example:

- o A guide for Rapid Assessment Procedures for Nutrition and Primary Health Care (Scrimshaw and Hurtado 1987) was recently published after extensive field development that involved the collaboration of groups in several countries. The manual focuses on anthropological approaches to improving program effectiveness, addressing such topics as: practical anthropology for health programs; anthropological methods; focus groups; selection, training and supervision of field workers; data analysis and report production. The book

provides simple, practical data collection guides for use in community, household, and primary health care provider investigations.

- o A monograph on An Anthropological Approach to Nutrition Education (Nichter and Nichter 1981) prepared for the International Nutrition Communication Service (INCS) offers a wide range of valuable ideas and practical tools for nutrition educators. It begins by identifying the major food and nutrition conceptual models found among traditional cultures in the developing world. It suggests ways in which educators can promote sound nutrition by working with (instead of ignoring) "folk dietetics." A "community diagnosis" methodology is proposed for assessing the nature of food, nutrition, health and illness beliefs of traditional societies. A guide outlining both core data needs and practical methods for conducting the community diagnosis are included. Throughout their discussion the authors emphasize the practical implications that anthropological insights can have for nutrition interventions.
- o A manual detailing A Methodology for Diagnosis Causes of Malnutrition at the Community Level (Eckroad 1981) was developed by a University of Valle research team working with Community Systems Foundation staff in **Colombia**. The guide, which was field tested extensively, uses a systems view as the unifying element.

Use of Ethnographic Techniques to Explore Infant Feeding Practices

Ethnographic studies often provide an important contribution to in-depth understanding of the cultural context in which nutrition improvement programs must be developed. A few of the useful ethnographic studies reviewed during this project are listed as examples of the type of work currently being undertaken in this field:

- o "Socialization for Scarcity: Child Feeding Beliefs and Practices in a Haitian Village" by Alvarez and Murray (1981)
- o "Local Perception of Breastfeeding, Fertility, and Infant Care in Anjur, Yemen Arab Republic" by Adra (1983)
- o "Infant Mortality and Infant Care: Cultural and Economic Constraints on Nurturing in Northeast Brazil" by Scheper-Hughes (1984)
- o "Infant Feeding in Mali, West Africa, Variations in Belief and Practice" and "Breastfeeding and Weaning in Mali: Cultural Context and Hard Data" by Dettwyler (1986b and 1987a)
- o "Social, Economic and Ecological Parameters of Infant Feeding in Usino, Papua New Guinea" by Conton (1985)

A series of well-researched "Maternal and Infant Nutrition Reviews" focusing on a number of the designated "Child Survival" countries have been produced by the International Nutrition Communication Service (INCS 1981-1984). These monographs review the available literature on maternal and infant nutritional status and beliefs and practices in the various countries they cover, providing annotated bibliographies as well. They list and review ethnographic research as well as other types of studies.

Several organizations have experimented with approaches integrating the use of ethnographic and survey research. Just one such effort, in the area of infant feeding, is described below.

- o The Population Council used both ethnographic and survey research methods in its Infant Feeding Study in urban areas of **Thailand, Indonesia, Kenya, and Columbia**. A Population Council Working Paper, "Integrating Ethnographic and Survey Research: A Review of the Ethnographic Component of a Study of Infant Feeding Practices in Developing Countries" (Van Esterik 1983) both examines the value of the combined approach and details the techniques used for implementing the ethnographic fieldwork. The author suggests that while ethnographic methods maximize contact and thus may enhance understanding, survey methods may be helpful in increasing objectivity. Ethnographic samples are often small, non-random and purposive and can capitalize on the contributions of key informants with special knowledge. Survey results, on the other hand, are more representative and can be generalized. Ethnographic fieldwork can delve more deeply into sensitive questions, while surveys may avoid some of the biases often inherent in participant observation techniques. The two approaches are complementary tools which provide better coverage in research on complex problems such as infant feeding. (Also see Van Esterik 1989.)

Use of Qualitative Research Tools in Nutrition Project Design and Implementation

Several organizations involved in nutrition improvement projects have worked to adapt qualitative research tools to address practical nutrition project design issues. Just a few of the research tools now commonly used are reviewed below.

Observational studies. Observational studies have provided rich insights into the dynamics in both community and institutional settings that have a bearing on infant feeding, nutrition and survival. For example, a fascinating article on "Dynamics of Infant Feeding: Mothers, Professionals, and the Institutional Context in a Large Urban Hospital" (Winikoff et al. 1986) illustrates the detailed and often surprising data that can be gained through systematic observation.

A variety of observational tools have been suggested by various investigators. Winikoff (1981), for example, suggests the construction of accurate lifetables of breastfeeding and weaning events as a helpful method for identifying typical points at

which mothers tend to stop nursing. Raphael (1982) illustrates the construction and use of day charts of feeding behavior as tools to assist in observing and recording the rich interplay between the societal forces and interpersonal dynamics that effect feeding patterns.

Focus group techniques. Focus group techniques have been used extensively in recent years, both in nutrition improvement projects and in child survival activities in general. Firms such as Manoff International and the Academy for Educational Development, for example, have used the technique repeatedly in nutrition education design work, often with valuable results. Many commentaries extol the assets of the approach, which involves assembling small groups of informants for often informal but guided group interview sessions. Focus groups are especially useful for immersing project implementors in the language and perspective of local groups, and are also excellent for measuring consensus behavior.

Focus groups are not a panacea, however, or a quick technical fix for all problems. Hornik (1985) has provided a cautionary note. He suggests that many authors disparage individual interviews as expensive and call with enthusiasm for the focus group approach without distinguishing the particular purposes each can serve. Individual interviews are not necessary when investigators want to quickly gage the thinking of particular types of community groups. Focus groups are better suited for this purpose. The feedback obtained from them, however, may be somewhat biased, as participants with dissenting views are often reluctant to voice them in sessions with their neighbors. Thus important variations in community belief and practice may be missed. The focus group, Hornik observes, is also particularly vulnerable to "striking anecdotes," which may influence program activities more than they should. Individual interviews can be quite helpful in exploring variations, and may be used in testing explanations for behavior by using separately measured characteristics to predict actual infant feeding behavior. Drawbacks to individual interviewing include costs and, perhaps just as important, the unnaturalness of the approach in developing countries where questions and problems are more comfortably addressed in the group setting.

Participatory approaches at the household level. Creative techniques for involving mothers and other household members in meaningful roles in project design have been designed and tested in nutrition intervention projects. A quite practical version of this type of strategy was developed and used quite successfully by Manoff International in its work in the Nutrition Education and Behavior Change Component of the **Indonesia** Nutrition Development Project. The technique involved home investigations, during which trained interviewers met with target group mothers to discuss important nutrition topics (e.g., diet during lactation and the introduction of solid food to infants five to eight months old) and worked together with them to select and prepare specific recipes that the mothers would use for their weaning age children. The interviewers listened, probed, and participated in food preparation activities with the mothers, and noted significant observations. The mother gave important feedback on the practicality of the trial behavior, often proposing changes to make it more acceptable. A follow-up visit was made several days later to determine

the mother's reaction to the trial, and revise techniques, if necessary. The household visits provided invaluable information for nutrition concepts and messages design (Griffiths et al. n.d., Mantra et al. 1985, Manoff 1984).

Behavioral analysis and health practice studies. The Academy for Educational Development, among other groups, has been working for several years to further develop and test methodologies for reinforcing and modifying behavior. An article by Elder (forthcoming) describes some of this past work on behavioral analysis. The semiannual reports for HEALTHCOM for 1987 discuss on-going health practice studies which use a variety of approaches, in some cases experimenting with combining the technologies of behavior modification and social marketing for program design (Academy for Educational Development 1987a and b). The new techniques should prove quite useful to organizations working in nutrition and health education.

Conclusions and Recommendations

1. Useful qualitative research methods. Project managers should examine what types of qualitative research methods may be useful for solving design and operational problems at the program level. Some of the methods that infant feeding and nutrition projects have found particularly helpful in recent investigations have included:

- o Community assessments and diagnoses, using locally-developed research instruments or one of a number useful guides
- o Ethnographic techniques designed to explore infant feeding practices, often times in combination with more quantitatively-oriented survey research
- o Qualitative research tool such as observational studies, focus group techniques, participatory approaches to household investigations, and health practice studies

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Key to Codes Used in Bibliography:

[Country name] = Document provides information related to the country, but its name is not listed in the citation

[USAID] = Document is in the AID/CDIE collection.

[IFMN] = Document is in the collection at APHA Clearinghouse on Infant Feeding and Maternal Nutrition, Washington D.C.

[UNICEF] = Document is in the library at UNICEF/New York.

[Wellstart] = Document is in collection at Wellstart, San Diego.

* = Study sponsored by A.I.D.

¹ This selected bibliography contains only the references cited in this monograph. See the fifth publication in this series, Breastfeeding, Weaning and Nutrition: Expanded Bibliography, for a more complete bibliography on this subject.

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