



Academy for Educational Development

PD-ABP-418
94831

IEC Component of the Peru Breastfeeding Project

1988 – 1990

FINAL REPORT

**Nutrition Communication Project
June 1995**

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**IEC COMPONENT
OF THE
PERU BREASTFEEDING PROJECT**

February 1995

**Nutrition Communication Project
Academy for Educational Development
1255 23rd Street, N.W.
Washington, DC 20037**

This activity was carried out through support from the United States Agency for International Development, Office of Health and Nutrition, under contract DAN-5113-Z-00-7031-00 (Project 936-5113). Additional funding for post-project evaluations was provided by USAID/Lima and the Bureau for Latin America and the Caribbean through PIO/T No. 597-0000-3-7653041.

ACKNOWLEDGEMENTS

The breastfeeding promotion activities described in this report were conducted by the Nutrition Communication Project (NCP) under the Academy for Educational Development's Contract No. DAN-5113-Z-00-7031-00 with the Office of Health and Nutrition in the Global Technical Bureau of the U.S. Agency for International Development (USAID). Additional funding for post-project evaluations was provided by USAID/Lima and the Bureau for Latin America and the Caribbean through PIO/T No. 597-0000-3-7653041. NCP's work in Peru was carried out as part of a larger two-year intervention research project entitled: "A Controlled Trial to Extend the Duration of Exclusive Breastfeeding Among Low-Income Women in Lima, Peru," (also known as the Peru Breastfeeding Project) conducted by researchers from the Johns Hopkins University and the Universidad Peruana Cayetano Heredia in Lima and supported principally by the Population Council, with funding from USAID's Office of Population. Additional support was provided by the Wellstart, both as a subcontractor to AED and through the Office of Nutrition's Lactation Management Education Program.

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ACRONYMS

AED	Academy for Educational Development
IEC	Information, education and communication
KAP	Knowledge, attitudes and practices
NCP	Nutrition Communication Project
PROCAME	Training of Health Personnel in Clinical Management of Children with Diarrhea or Acute Respiratory Infection and Management of Breastfeeding and Weaning Project
USAID	U.S. Agency for International Development

EXECUTIVE SUMMARY

The Peru Breastfeeding Project was a two-year quasi-experimental study to develop and evaluate the effectiveness of a hospital-based intervention in increasing the proportion of mothers who exclusively breastfed their infants up to six months of age. The breastfeeding promotion intervention was carried out between 1988 and 1990 in two large hospitals serving low-income groups in Lima, using a third public hospital as a control. The project was carried out by researchers from the Johns Hopkins University and the Universidad Peruana Cayetano Heredia with primary funding from the Population Council, under agreements financed by the U.S. Agency for International Development, Office of Population. To aid in the design of the project's information, education and communication (IEC) component, the researchers requested the technical assistance of the Academy for Educational Development's Nutrition Communication Project (NCP).

The project had four stages. The first sought to identify the behavioral and institutional constraints to exclusive breastfeeding through interviews with mothers in four districts of Lima and hospital interviews with postpartum women in the study hospitals, a survey of knowledge, attitudes and practices (KAP) of hospital personnel, and a review of hospital procedures in the three sites. The second stage applied the findings of the first stage to the training of hospital personnel and the development of educational materials. In stage three, mothers in the intervention hospitals were then exposed to breastfeeding promotion messages through interpersonal communication with health personnel and the educational materials developed by the project. In the fourth and final stage, the effects of the intervention were evaluated through a repeat KAP survey of hospital personnel and a prospective follow-up of 360 mother-infant pairs who had delivered at the three hospitals.

NCP's role in the project was concentrated in the second stage, using the findings from the ethnographic and baseline research to understand hospital personnel's and mothers' existing knowledge, attitudes, practices and perceived constraints to exclusive breastfeeding. NCP then worked with a local Peruvian production group (Asociación Perú-Mujer) to develop specific communication messages and educational materials aimed at mothers and health workers, focusing on the early introduction of water and traditional teas — practices that had been identified as the biggest barriers to exclusive breastfeeding in the urban population.

The educational materials developed with NCP support consisted of: 1) a pocket reference guide entitled, "Breastfeeding: A Guide for Health Personnel," that was distributed to all health workers during their training; 2) a 10-card flip chart, of which a half-dozen copies were placed in each intervention hospital; and 3) a poster-style calendar that was given to all mothers delivering at the two intervention hospitals (Cayetano Heredia and Dos de Mayo) during the study period. The print materials were intended to support health personnel in effectively counseling mothers and promoting exclusive breastfeeding. The take-home poster/calendar was intended to reinforce key messages among mothers after they had left the hospital.

Because of regional interest in the breastfeeding reference guide for health personnel, NCP supported the distribution of copies of the guide for use in Bolivia, Ecuador and Colombia, as well as to other agencies working in breastfeeding promotion in Latin America.

The project's evaluation showed that the intervention was successful in achieving marked improvements in health provider knowledge of appropriate infant feeding practices, particularly regarding the inappropriateness of giving water, other liquids or bottles to young infants and the importance of encouraging exclusive breastfeeding through six months of age. However, this improved knowledge did not always translate into effective counseling of mothers, as illustrated by the lower levels of exposure to the educational intervention among mothers at one of the intervention hospitals (Dos de Mayo).

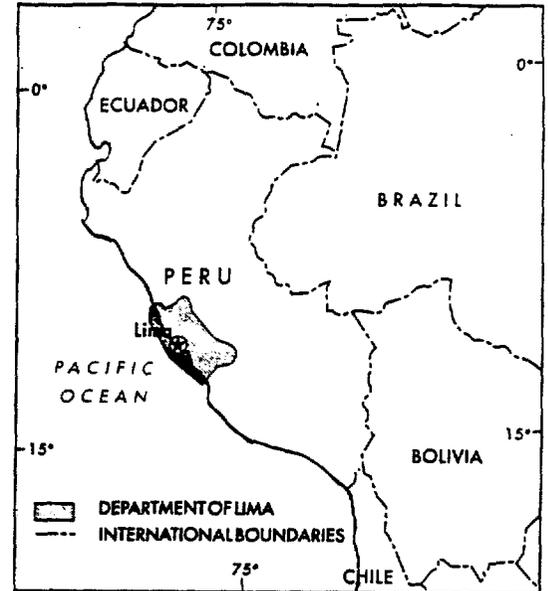
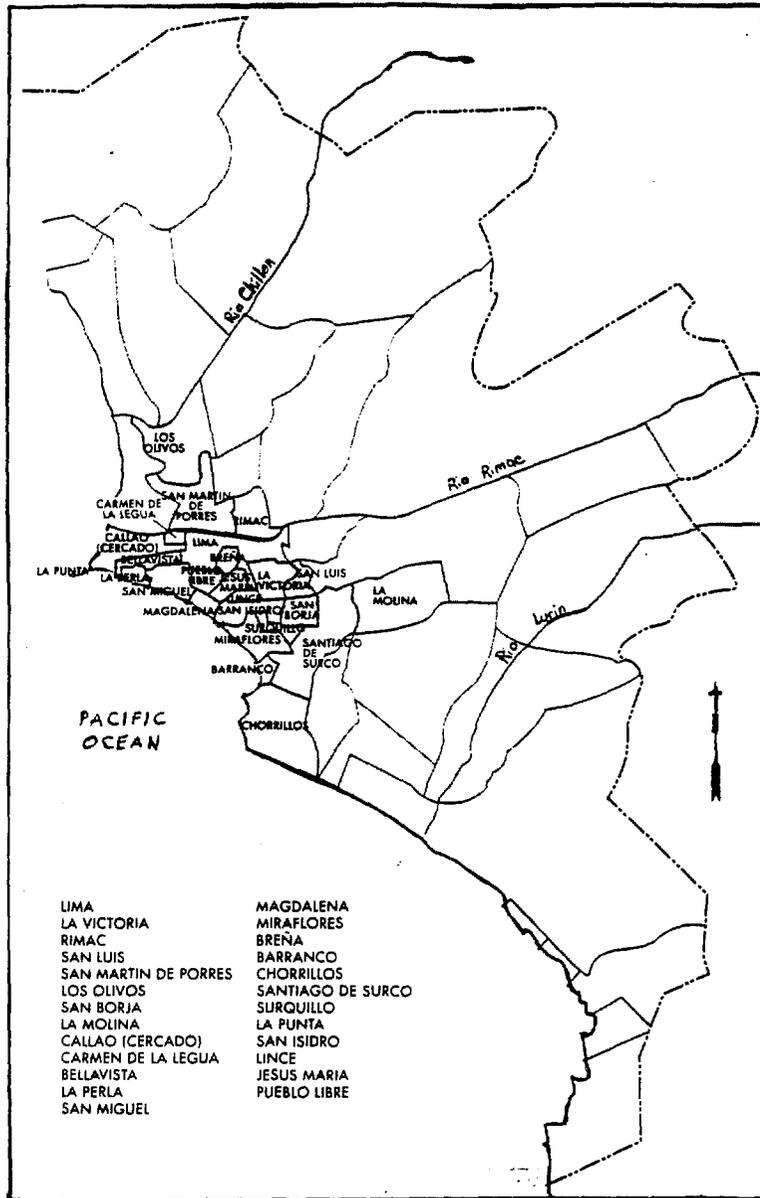
The project's most significant accomplishment was the relatively high prevalence of exclusive breastfeeding attained among mothers who delivered at Cayetano Heredia, the intervention hospital with the most complete and intensive intervention among both health providers and mothers. Postpartum follow-up of mothers in the three hospitals showed dramatic improvements in the prevalence of exclusive breastfeeding among mothers exposed to the educational materials, with 52 percent of mothers who had delivered at Cayetano Heredia hospital continuing to exclusively breastfeed at 12 weeks, as compared with 17 percent at Dos de Mayo hospital and only 8 percent of mothers from the control hospital (Loayza).

Two years after completion of the project, USAID/Lima requested that NCP conduct a follow-up evaluation of the hospital-based intervention. The follow-up evaluation carried out in Cayetano Heredia and Dos de Mayo hospitals in early 1992 (some 32 months after hospital workers received training and materials) demonstrated that while important changes had occurred in the two hospitals as a result of the intervention, both facilities continued to experience problems with inadequate knowledge of lactation management among health personnel and limitations on breastfeeding counseling of mothers. Personnel experienced difficulties with the use of the flip chart (particularly those not trained as part of the intervention), and copies of the breastfeeding guide for health personnel developed by the project were no longer available for easy reference by new personnel. No take-home print materials with breastfeeding information were available for mothers. The follow-up evaluation concluded that while the project demonstrated impressive gains during the intervention period, conditions no longer existed in the two hospitals to facilitate consistent breastfeeding counseling of mothers.

The Peru Breastfeeding Project proved to be an excellent example of the usefulness of the social marketing approach for identifying and refining messages tailored to modify specific breastfeeding-related behaviors that were found to be susceptible to influence. The 20-hour training course, supported by a thorough reference guide designed for hospital personnel, resulted in sharp improvements in health worker knowledge and attitudes that persisted long after the training activity itself. The overall effects of a one-time training activity in a facility are, however, limited due to staff turnover. In order to ensure that training interventions fully achieve their objectives, hospitals need to develop strategies for ongoing training of new personnel, as well as for refresher training.

More importantly, the study showed that increasing health workers' knowledge does not automatically translate into more effective application of that knowledge in the process of educating and counseling mothers during the delivery of health services. While the study focused on changing health workers' knowledge and attitudes and sought to facilitate communication with mothers by providing specific tools (such as the flip chart and poster), in practice improving the quality of education and counseling requires placing greater emphasis in training on improving health workers' counseling skills. Training must then be complemented by ongoing monitoring and supervision of how health personnel are actually applying their knowledge during routine service delivery activities. All hospital personnel with a role in instructing mothers need training in how to effectively use educational materials to counsel as well as how to take greater advantage of the different opportunities for counseling women during their hospital stay.

FIGURE A
Map of Lima, Peru



I. BACKGROUND

As has occurred in most Latin American countries, optimal breastfeeding practices — defined as exclusive breastfeeding during the first six months and continued breastfeeding through two years to complement the provision of age-appropriate foods — have declined in Peru. While the overall prevalence of breastfeeding through 12 months of age remains high, the prevalence of *exclusive* breastfeeding in the first months of life (that is, feeding the infant only breastmilk, without water, teas, or other milks and liquids) has dropped to low levels.

A longitudinal study of 153 infants conducted in 1982-84 in the marginal community (*pueblo joven*) Huascar, Canto Grande, of Lima illustrates the feeding practices that undermine exclusive breastfeeding (Brown and others 1989). The study found that while nearly all infants were breastfed in the first month, and some 86 percent continued to be breastfed at 12 months, only 13 percent of mothers gave the newborn only breastmilk in the first 24 hours of life. Some 75 percent of mothers reported giving some type of herbal tea and 12 percent reported giving infant formula or other milk in the first 24 hours. By one month of age, only 12 percent of infants were exclusively breastfeeding, while 83 percent of the infants had been given teas and almost 40 percent other milk or formula. By three months, the prevalence of exclusive breastfeeding was only about 5 percent.

This situation is of critical public health significance because the protective effects of breastfeeding against diarrheal and other common childhood infections, as well as the fertility-reduction effects, are only realized when breastfeeding is exclusive. Studies in Lima and Brazil have documented that giving water in addition to breastmilk in poor urban communities more than doubles the relative risk of diarrhea for young infants (Victora and others 1989). The promotion of exclusive breastfeeding should thus be a public health priority.

WHO, UNICEF, USAID, and other international agencies have encouraged and provided support for more effective strategies to promote exclusive breastfeeding. One strategy that has been successful in a number of countries in improving initial feeding practices is hospital-based promotion of exclusive breastfeeding, targeting education and counseling at mothers in the time surrounding birth. As seen in box 1, the majority of the Peruvian population lives in urban areas (28 percent in the Lima metropolitan area alone), and a large proportion of urban mothers have their births attended in hospitals. A hospital-based breastfeeding promotion intervention thus offers potentially high coverage of women at a critical moment in decisionmaking about infant feeding.

Rationale for the Peru Breastfeeding Project

To evaluate the effectiveness of a hospital-based intervention to extend the duration of exclusive breastfeeding among low-income women in Lima, Peru, a group of researchers from Johns Hopkins University and the Universidad Peruana Cayetano Heredia developed the Peru Breastfeeding Project, a two-year controlled trial project. The study sought to analyze and apply lessons from ethnographic research on the behavioral factors and beliefs undermining exclusive

breastfeeding to the design of training for hospital personnel to improve their ability to counsel mothers to exclusively breastfeed and to improve their skills regarding prevention and proper clinical management of lactation problems. The research project was financed primarily by the Population Council, under funding from the U.S. Agency for International Development (USAID) Office of Population, Division of Research. The researchers requested the technical assistance of the Academy for Educational Development (AED)'s Nutrition Communication Project (NCP) for the development of the project's information, education and communication (IEC) component.

For NCP, collaboration on the Peru project represented an important opportunity to apply social marketing methods to: 1) analyze why breastfeeding is not practiced exclusively and identify critical behaviors potentially receptive to change; and 2) to develop effective, locally appropriate informational and educational materials focusing on these critical behaviors, to support health worker training and counseling of mothers.

Scope of NCP Activities in Peru

NCP provided approximately \$57,000 to support the IEC activities of the Peru Breastfeeding Project. The project activities directed by NCP included: 1) reviewing the project's ethnographic research data to identify critical behaviors that should be targeted in message development; 2) guiding and conducting focus groups to complement this research and pretest messages and materials; 3) developing appropriate breastfeeding messages for the print materials; 4) selecting and supervising a Peruvian production group to produce the materials; and 5) assisting the group to select images and formats for the materials. While the overall project was conducted from October 1988 through September 1990, the bulk of NCP involvement occurred between November 1988 and April 1989.

Box 1 Peru Fact Sheet, 1990

Total population	22,332,100
Urban population (%)	69
Total fertility rate (births per woman)	3.6
Female literacy (%)	79
Per capita GNP (US\$)	1,300
Women receiving prenatal care (%)	57
Deliveries in formal health facilities (% of births, Lima only)	75
Deliveries by trained attendants (% of births)	55
Infant mortality rate (deaths per 1,000 live births)	76
Under-five mortality rate (deaths per 1,000 live births)	100
Maternal mortality rate (deaths per 100,000 live births)	301

Prevalence of undernutrition:

Age	Weight/Age	Height/Age	Weight/Height
6-11 mos.	13.7	18.9	2.0
12-17 mos.	22.7	34.9	3.7
18-23 mos.	20.9	44.8	1.8
24-35 mos.	15.0	40.0	0.5

Sources:

Development Group Inc. 1991; Institute for Science and Technology Inc. 1991; World Bank 1993.

The Office of Health, Population and Nutrition of the Latin America and Caribbean Bureau of USAID also funded NCP to print 2,000 additional copies of a breastfeeding reference guide, the main educational tool developed for health personnel, for distribution within Peru and to USAID Missions in Bolivia, Ecuador and Colombia.

Two years after the completion of the Peru project, USAID/Lima requested that NCP conduct a follow-up evaluation of the hospital-based intervention. In February 1992, AED Communication Specialist José Mata and a local breastfeeding specialist, Dr. Sarah María Vega, examined current breastfeeding-related activities in the two intervention hospitals and compared current health worker knowledge of the 10 key messages relayed in the educational materials with knowledge levels found before the intervention. The results of that evaluation were presented to USAID/Lima and the project director of the Peru Breastfeeding Project to guide the future design of hospital-based IEC activities to promote breastfeeding.

In addition, NCP was asked by USAID/Lima to collaborate with CARE/Peru in integrating the experience of the hospital-based breastfeeding promotion in the design of educational materials for use in CARE's child survival program in periurban areas of the Arequipa and Chiclayo Departments. In August and September 1992, NCP provided the services of Senior Communications Specialist Dr. José A. Romero to select IEC materials on breastfeeding and weaning available in Peru, including those developed in the Peru Breastfeeding Project, and assess their appropriateness and adequacy for low-income audiences in the two provincial cities using focus groups.

This country report covers only the NCP activities related directly to the Peru Breastfeeding Project. The field test of educational materials in Arequipa and Chiclayo is covered in depth in a separate NCP report (see Romero and others 1992).

II. PROJECT DESIGN

Objectives and Design of Peru Breastfeeding Project

The goal of the two-year Peru Breastfeeding Project was to extend the duration of exclusive breastfeeding among low-income women in Lima and ultimately to reduce the incidence of diarrheal disease and improve the growth of young infants. The specific objective of the study was to develop and evaluate the effectiveness of a hospital-based intervention in increasing the proportion of mothers who exclusively breastfed their infants up to four months of age. The study employed a quasi-experimental design, implementing the breastfeeding promotion intervention in two large hospitals serving low-income groups in Lima and using a third public hospital as a control.

The study had four stages. The first identified behavioral and institutional constraints to exclusive breastfeeding through open-ended interviews with mothers in four districts of Lima; hospital interviews with postpartum women; a survey of knowledge, attitudes and practices (KAP) of hospital personnel; and a review of hospital procedures in the three sites. The second stage involved development of a 20-hour in-service training course for hospital personnel in the two intervention facilities and the development of the educational messages and materials. Next, hospital personnel from obstetrical and pediatric neonatology units in the two intervention hospitals were trained by the project teams and received copies of educational materials.

In the third stage, the educational component was fully operational. All was in place for mothers delivering in the intervention hospitals to be exposed to breastfeeding promotion messages through the educational materials and interpersonal communication with health personnel. The effects of the intervention were evaluated in the final stage through a repeat KAP survey of hospital personnel and a prospective follow-up of 360 mother-infant pairs who had delivered at the three hospitals, through home visits at two, four, eight and 12 weeks.

NCP's role in the project was concentrated in the second stage. The major aspects of NCP participation in the Peru Breastfeeding Project are summarized in box 2.

Rationale for the Hospital Intervention

A hospital-based intervention was chosen for the study for several reasons. First, a large proportion of infants are delivered in hospitals in Lima, and the hospital maternity stay represents perhaps the most extensive contact that many low-income women have with health personnel. Second, medical professionals were believed to be highly credible sources of advice for mothers on infant feeding. Finally, anecdotal evidence and the personal experience of the researchers suggested that health personnel frequently advised mothers to supplement breastfeeding with other liquids. The intervention was thus targeted at modifying the messages communicated by health personnel to clearly advocate exclusive breastfeeding.

Box 2**Peru Breastfeeding Project Fact Sheet for the IEC Component**

NCP Partners:	Universidad Peruana Cayetano Heredia Johns Hopkins University Population Council Asociación Peru-Mujer Wellstart/San Diego Lactation Program
Project Duration:*	Start-up date: October 1, 1988 End date: September 30, 1990
NCP Funding:	Central funds: \$40,000 Vitamin A: \$15,000 LAC/DR/HPN: \$ 2,000
Media Mix:	Interpersonal, print materials
Key Products:	7,000 poster/calendars 2,500 breastfeeding reference guides for health personnel 40 flip charts (10 cards each)
Future Directions:	Breastfeeding guide for health workers was distributed in Peru (outside the project area), Ecuador, Colombia and Bolivia and adapted for use in the Honduras National Program to Promote Breastfeeding. 9,500 copies of the guide and 200 flip charts were printed through UNICEF Baby Friendly Initiative and the Ministry of Health/PROCAME II Project for use by health workers throughout Peru.
Special Features:	NCP performed a follow-up evaluation of health personnel knowledge and hospital practices with respect to breastfeeding promotion in the two intervention hospitals after the project ended.
Research:	Focus group discussions to complement the ethnographic survey and to test messages and materials.

* The IEC component was conducted primarily November 1988 through April 1989.

The two intervention hospitals were Cayetano Heredia Hospital, the teaching hospital of the Universidad Peruana Cayetano Heredia, perhaps Peru's most distinguished medical school, and Dos de Mayo Hospital, one of the principal public hospitals in Lima and a teaching hospital of the Universidad Nacional Mayor de San Marcos. The control hospital was Arzobispo Loayza Hospital, another large public hospital. Each hospital attends some 300-350 deliveries each month, serves primarily low-income populations, and had some prior experience with breastfeeding promotion. Cayetano Heredia was the first hospital in Peru to introduce rooming-in

(in 1978) and establish norms to promote and support exclusive breastfeeding. Dos de Mayo began a program of rooming-in for normal deliveries in 1985. Loayza has also offered rooming-in for normal deliveries since 1986, but has reported difficulties in implementing this for lack of personnel.

Institutional Actors and Roles

The project was directed by Dr. Laura C. Altobelli, a maternal and child health specialist, who developed and implemented the project as a Johnson & Johnson Postdoctoral Fellow in Infection Prevention at the Johns Hopkins University. Dr. Elaine L. Larson, Nutting Chair in Clinical Nursing at the Johns Hopkins University School of Nursing, was the director of the Johnson & Johnson Postdoctoral Program in Infection Prevention and was the project's co-investigator. Co-principal investigator, Dr. Nelly Baiocchi, and another collaborating researcher, Dr. Eduardo Salazar-Lindo, were faculty in the Department of Pediatrics. The majority of study costs were supported through a research grant from the Population Council. Technical assistance in project design was also provided by Dr. Beverly Winikoff of the Population Council.

Dr. Altobelli and her colleagues at Universidad Peruana Cayetano Heredia conducted the ethnographic study in four districts of Lima and the baseline data collection in the three study hospitals. In January 1989, a specially-selected multidisciplinary team of five health professionals including the project team received two-and-a-half weeks of training at the Wellstart Lactation Management Program in San Diego, and designed and conducted a 20-hour in-service training program for personnel in the two intervention hospitals based on the Wellstart curriculum. The research team then designed and directed the evaluation, including the repeat KAP survey of hospital personnel and the prospective home visit follow-up of mothers from the three hospitals.

NCP provided technical and financial assistance to develop the study's communication strategy and materials. The primary NCP participant in the project was consultant Peggy Koniz-Booher, who provided technical assistance in message development and materials design and wrote the text for the breastfeeding guide for health workers. AED subcontracted with the Asociación Perú-Mujer to develop the flip chart, poster and health workers' guide and to arrange their production. Printing of the materials for use in the intervention was funded out of the Population Council grant. Dr. Altobelli worked closely with Ms. Koniz-Booher and the Perú-Mujer team to review the results of the formative research and formulate possible messages. She also participated in the focus groups with mothers to test proposed messages and artwork.

NCP home office staff, including NCP Director Ms. Margaret Parlato and Deputy Director Dr. Claudia Fishman, and consultant Dr. Sandra Huffman reviewed the results of the formative research and provided guidance in identifying behavioral objectives. Lactation management experts at Wellstart (San Diego), an NCP subcontractor, reviewed the technical content of the breastfeeding reference guide for health workers.

Synopsis of Project Phases

The study's four stages (formative research, intervention design, implementation, and evaluation) were conducted over a two-year period from September 1988 through December 1990. The timing of the principal activities of each stage is shown in table 1.

Table 1
Timeline of Key Project Activities (1988-90)

Study Stage	Project Year 1			Project Year 2		
	SOND	JFMA	MJJA	SOND	JFMA	MJJA
STAGE 1: Formative Research to Identify Constraints						
In-depth interviews of mothers in four districts of Lima	x					
KAP survey of personnel and procedures in three study hospitals	xx					
KAP survey of postpartum mothers in three study hospitals	xxx					
Data analysis and interpretation	xxxx	xxx				
STAGE 2: Design of the Intervention						
Review of formative research to formulate messages	xxx	xxx				
Development of prototype materials	x	xxxx	xxxx	xxxx	xx	
Focus groups to review messages and prototypes	x	xxx				
Team trained at Wellstart and in-service training designed		xxxx				
Messages and materials finalized and materials produced		xxxx	xxx			
In-service training conducted in two intervention hospitals		x	xx			
STAGE 3: Implementation of the Intervention						
Breastfeeding promotion/counseling and distribution of educational materials to mothers			xxxx	xxxx	xxxx	
STAGE 4: Evaluation						
Prospective study of 360 mother-infant pairs				x	x	
Survey of personnel in three hospitals					x x	

III. DEVELOPMENT OF THE INFORMATION, EDUCATION AND COMMUNICATION COMPONENT

Review of Formative Research

Three surveys were carried out by the researchers from the Johns Hopkins and Cayetano Heredia universities in the first quarter of project implementation to gather information on the behavioral and institutional constraints to exclusive breastfeeding. The first was a rapid ethnographic assessment consisting of open-ended questions with a convenience sample of 80 mothers with children under age five from four low-income districts of Lima that are served by the three study hospitals. This research was complemented by a sample survey of 308 postpartum mothers conducted in the study hospitals to determine what type of breastfeeding advice and support they had received during their hospital stay as well as their plans for infant feeding. This survey was also done to establish the sociodemographic comparability of study mothers in the three different hospitals. The third baseline survey was a self-administered KAP survey of 323 health personnel (physicians, nurses, midwives and auxiliaries) working in the pediatrics, neonatology and obstetrics services in the study hospitals. Key findings from the ethnographic studies are summarized in box 3.

Box 3	
Key Findings from the In-Depth Interviews in Four Districts of Lima	
Exclusive breastfeeding	73% of mothers who breastfed stopped breastfeeding infant exclusively by two months of age
Bottlefeeding	86% of mothers who gave their infants bottles 85% of those who gave bottles did so before three months of age
Use of water and teas	99% of mothers gave their babies water/teas (<i>aquitas</i>) 61% of mothers gave water/teas in the first week of life 76% of mothers used bottles to give water/teas 16% of mothers used a spoon to give water/teas
Reasons for introducing water and teas	63% of mothers mentioned "infant's thirst" 60% of mothers mentioned "gases or colic" 38% of mothers mentioned "constipation"
Introduction of solids	43% of mothers had introduced solid foods by 3 months of age 62% of mothers had introduced solid foods by 4 months of age
Illness	18% of mothers who were breastfeeding and whose child experienced diarrhea recently had stopped breastfeeding during that episode 80% of mothers thought a woman should stop breastfeeding when she was ill 43% of mothers thought breastmilk could go bad
Sore nipples	63% of mothers had experienced sore nipples

Results from the three formative research studies were reviewed by the university researchers and the NCP team to identify the critical obstacles to extending the period of exclusive breastfeeding and their implications for the design of the intervention's IEC component. Although earlier research by Ken Brown and others (1989) had identified the problem regarding early use of water and other milks, the reasons why mother mothers practiced these behaviors were poorly understood. The main conclusions drawn from the research results were:

- ▶ Breastfeeding is well accepted in this population, so there is little need to emphasize the benefits of breastfeeding.
- ▶ The early introduction of water and herbal teas (*aquitas*) is the key obstacle to exclusive breastfeeding and should be the primary emphasis of the educational messages. The educational intervention should narrowly focus on a limited number of messages designed to discourage the use of water in the first six months.
- ▶ To improve breastfeeding practices that lead to increased milk output, the messages should focus on the elimination of bottles and the need for feeding on demand.
- ▶ To keep down the number of messages, the focus should be on eliminating teas served in bottles to address both the concerns over inadequate milk output and the concern for exposure to pathogens causing diarrhea.
- ▶ Because health professionals were frequently cited as the source of advice for giving water and teas and formula, the training intervention should focus on changing the perception of health professionals that infants should be given water in the first hours after birth and during the summer. The intervention for health professionals should also focus on how to identify and modify a mother's beliefs regarding use of waters.
- ▶ While about 25 percent of the mothers interviewed reported to be working, many of these were in the informal sector where the infant could accompany the mother; work outside the home was thus not perceived as a major obstacle to exclusive breastfeeding that needed to be addressed in the intervention.

Behavioral Objectives and Communication Strategy

After reviewing results of the ethnographic research, the NCP team recommended that the message strategy narrow its focus to the early introduction of water and teas and related issues concerning frequency and sufficiency of breastfeeding, strategies to alleviate colic and thirst, and use of bottles. The decision was made to limit the number of messages imparted to mothers in the educational materials so as to maintain this narrow focus, for example the practice of giving other milks and liquids and to supplementary foods was not tackled. The key behavioral objectives of the IEC component were thus to convince mothers and health personnel that mothers should:

- ▶ Breastfeed exclusively from birth to six months
- ▶ Breastfeed more frequently to satisfy baby's thirst and reduce colic
- ▶ Do not give water, herbal teas or bottles in the first six months.

A synopsis of the communication strategy developed to address these behavioral objectives is presented in box 4.

Box 4	
Communication Strategy Synopsis	
Target Audience:	Approximately 7,000 mothers delivering in the intervention hospitals (low-income urban population) during the intervention period and 300 hospital personnel
Behavioral Objective:	Mothers will breastfeed exclusively for up to six months
Key Obstacles:	Early introduction of water and herbal teas; perceived thirst of infant
Key Promises:	Frequent breastfeeding will satisfy all of baby's needs and thirst, and help reduce colic
Media Mix:	Interpersonal communication and print materials
Tone:	The messages provide helpful advice on breastfeeding concerns, as from a knowledgeable source such as a health worker

Selection of the Peruvian Production Group

Based on discussions with USAID, the project director, and representatives of AED and the Population Council in Lima, two Peruvian groups were identified as potential candidates for the local group to be contracted to produce the educational materials. The Asociación Perú-Mujer was the only organization able to assemble the required communication team and meet the proposed production deadlines. A contract was negotiated between AED and Perú-Mujer to prepare the three educational materials proposed for the project: the breastfeeding guide for health workers, a set of breastfeeding counseling cards or flip chart for use by health workers, and a breastfeeding poster/calendar for mothers. (See box 5 for a description of the tasks performed by Perú-Mujer.) AED provided technical assistance to Perú-Mujer at all stages.

Box 5**Tasks Performed by Asociación Perú-Mujer**

1. Work with the project director, co-principal investigator and the NCP consultant to translate the proposed breastfeeding messages and concepts into phrases worded to be clearly understood by mothers.
2. Conduct four focus groups and six in-depth interviews with mothers and with health personnel in the two study hospitals to test the general messages and concepts and the proposed materials format.
3. Based on results from step 2, prepare mock-ups of drawings to complement the breastfeeding messages for mothers.
4. Pretest the mock-ups of the flip chart and the poster in a minimum of two focus groups in each intervention hospital.
5. Revise the mock-ups.
6. Obtain competitive bids from at least two printing companies in Peru for production of health workers' guide, poster and flip chart.
7. Prepare final, camera-ready artwork for flip chart and poster and typeset text and artwork for reference guide for health workers.

Selection of Materials

The decision to develop three educational materials for the intervention was made at the time the study was first formulated. The researchers were convinced that health workers would need a permanent reference guide to provide technical information on appropriate breastfeeding practices and lactation management that they could continue to use after the training course. The team was aware of a compact reference guide on breastfeeding that had been developed for nurses in New York City by the Population Council and planned to adapt this publication for use in Peru. The researchers also had decided that health personnel should be given a tool to facilitate breastfeeding counseling of mothers and that a series of large illustrated teaching cards would provide the most flexible instrument that could be used at a patient's bedside or with small groups of pregnant or postpartum women. Third, the researchers wanted to provide mothers with an educational take-home material to remind them of the key breastfeeding messages that were to have been emphasized during their hospital stay. The communication team decided that a poster-style calendar would be valued by mothers and later could be used to reinforce the specific date through which each mother should breastfeed exclusively and when the mother should begin introducing other liquids and solids.

The breastfeeding reference guide used in the intervention was written originally in English by NCP consultant Peggy Koniz-Booher in collaboration with the project team in Peru, by adapting

the text and illustrations of the breastfeeding reference guide for nurses that had been developed by the Population Council in collaboration with the Program for Appropriate Technology in Health and the Metropolitan Hospital Center for use in New York City hospitals. Much new material was added to make the guide culturally appropriate to Peru and to take into account the concerns and misconceptions identified by the project's ethnographic research. The English version was then translated to Spanish and reviewed by the Wellstart-trained team that would lead the health personnel training as well as by experts at Wellstart in San Diego, CA. The final guide developed in Peru was a 33-page pamphlet containing black-and-white technical illustrations and reproductions of the 10 key messages and drawings used in the poster/calendar.

The breastfeeding flip chart and poster/calendar were original materials developed for the project. The final materials are depicted in figures 1, 2, and 3. Each of the three materials covered the 10 major messages defined for the educational strategy.

Process of Message Development

During her November 1988 visit to Peru, NCP consultant Peggy Koniz-Booher developed a first draft of some 27 potential messages for mothers based on the preliminary findings of the ethnographic research and on accepted practices in lactation management. This initial list was refined into a shorter list of 17 messages. These messages were then pretested with two small focus groups of mothers at Cayetano Heredia hospital and one focus group comprised of nurses and auxiliaries. Based on the feedback from the three focus groups, the messages were shortened to 12 by dropping some messages and rewording and consolidating others. It was decided to give greater emphasis to optimal breastfeeding techniques and practices rather than to the promotion of breastfeeding *per se*. The reduced set of 12 messages was then tested with two focus groups of mothers in Dos de Mayo hospital. The list of 12 messages tested in Dos de Mayo hospital is shown in table 2, along with the final list of messages developed after further focus group testing.

The Perú-Mujer team consulted health providers at Dos de Mayo concerning their preferences with regard to the format for presenting the messages and images. Later, Asociación Perú-Mujer participated in conducting in-depth interviews with 12 women in the two hospitals to obtain reactions to the preliminary images drawn to accompany the messages.

As a result of the first two rounds of focus groups, the communication team proposed dropping the allusion to vaccinations in the first message (as it tended to confuse mothers) and adding a message about breastfeeding during illness of the mother. They also proposed adding a message about breast hygiene, due to a strongly felt concern expressed by health personnel about the need for mothers to wash their nipples before and after each nursing.

Figure 1
Breastfeeding Reference Guide for Health Personnel



LACTANCIA MATERNA
GUIA PARA EL PERSONAL DE SALUD

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Intended Use: Reference guide for hospital personnel in contact with mothers, to serve as a reference on breastfeeding norms and techniques; served as the participants' manual to complement in-service training course

Production Data: Copies printed: 2,500 (500 for use in two intervention hospitals; 2,000 for distribution throughout Peru and in other Latin American countries. Served as prototype for Honduras Reference Guide used in national program). 9,500 copies subsequently printed in Peru by UNICEF.
Language: Spanish
Approximate cost per unit: US\$0.75

Audience: Physicians, nurses, midwives, nutritionists, and auxiliary nurses

Figure 2
Flip Chart

Use by Health Personnel



Message 1



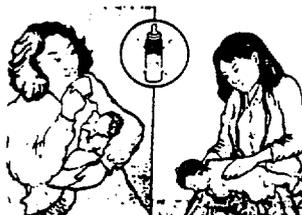
Message 2



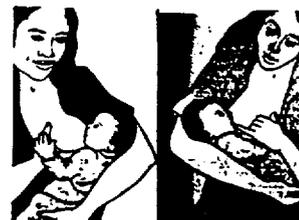
Message 3



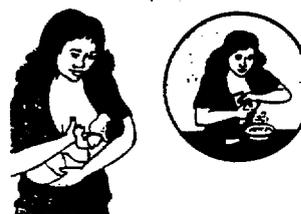
Message 4



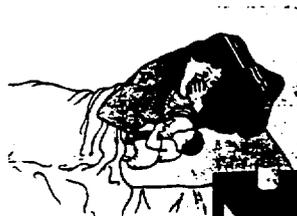
Message 5



Message 6



Message 7



Message 8



Message 9



Message 10

Intended Use: Tool for hospital personnel in counseling mothers either individually or in small group talks; front of each card shows a drawing depicting one key message for mothers shown on the poster/calendar; back of each card lists several related messages that the health worker should communicate to the mother to elaborate upon the main message

Production Data: Copies printed: 40 (25 for use in the two intervention hospitals; 15 for project implementors)
Language: Spanish
Approximate cost per unit: US\$25.00

Audience: Mothers with some primary school education

Figure 3
Poster/Calendar for Mothers

En los primeros días, amamante LM. Siempre para lactar, para un fortalecimiento para las necesidades alimenticias de su lactante. Esto garantiza lactancia exitosa.

Si su lactante amamanta frecuentemente, día y noche, usted producirá la leche que él necesita.

Si desea el crecimiento de su lactante como aguilón o como león, el lactante no tendrá espacio para la lactancia materna que necesita.

Si piensa que su lactante tiene sed, dale leche materna más frecuentemente. Esto aumenta la cantidad de agua que el lactante necesita.

La posición correcta del lactante asegura que mama bien y que LM. no se lacte los pezones.

Dele de lactar a su lactante siempre antes de comer.

La madre que no da su leche necesitará comer algo más de los alimentos que normalmente consume.

Desde los 6 meses, no lacte su lactante sólo la leche materna. Comenzará de la lactancia materna dando otros alimentos.

1989 LACTANCIA MATERNA EXCLUSIVA 1990

ENERO	FEBRERO	MARZO	ABRIL
D L M J V S	D L M J V S	D L M J V S	D L M J V S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
MAYO	JUNIO	JULIO	AGOSTO
D L M J V S	D L M J V S	D L M J V S	D L M J V S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
SEPTIEMBRE	OCTUBRE	NOVIEMBRE	DICIEMBRE
D L M J V S	D L M J V S	D L M J V S	D L M J V S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

Intended Use: One poster to be given to each mother delivering at the intervention hospitals upon discharge from the hospital during the study period; hospital personnel were asked to indicate on each mother's calendar the month during which the mother should begin to introduce complementary foods in addition to continued breastfeeding

Production Data: Copies printed: 7,000
Language: Spanish
Approximate cost per unit: US\$ 0.21

Audience: Mothers with some primary school education, minimal literacy

Table 2
Refinement of the Key Breastfeeding Messages

<p>List of 12 messages after first round of focus groups, prepared based on preliminary results of ethnographic research</p>		<p>Final list of 10 messages incorporated in print materials</p>
<ol style="list-style-type: none"> 1. In the first days, although you have only a little milk, it is the best thing and is enough for your baby's nutritional needs. Colostrum and breastmilk are the first vaccine for your baby. 2. The way to produce all the milk that the baby needs is to breastfeed every time he demands it. 3. To breastfeed, place all of the areola (dark part) in his little mouth. To finish breastfeeding, stick your finger in the baby's mouth so that he opens it better. This is the correct way to feed him and avoid problems with the nipple. 4. If your breasts are hard, breastfeed your baby more frequently. This will alleviate it. 5. Your milk is good for your baby, even when you are sick. It doesn't infect him but rather protects him. 6. Breastmilk is the only food your baby needs to grow healthy and strong. After six months of age, in addition to breastmilk he also needs other foods. 7. The best way to relieve baby's thirst and the heat of summer is to give the baby more breastmilk. It is not necessary to give him <i>aguítas</i>. 8. Filling your baby's stomach with <i>aguítas</i> doesn't leave room for the breastmilk that he needs. 9. Bottles are the main reason babies get gas, and <i>aguítas</i> don't help to get rid of gases. When your baby has colic, help him to get eliminate gases by placing him face down. 10. If you have to go out, leave your breastmilk in a cup so that it can be given to your baby with a spoon. 11. The breastfeeding mother needs to eat a little more. 12. You can breastfeed at night comfortably laying down without having to get up. 	<p style="text-align: center;">Further analysis of baseline research identified key areas that needed to be explored further to better understand mothers' practices and to guide refinement of the messages:</p> <ul style="list-style-type: none"> ▶ why and when mothers use <i>aguítas</i> ▶ thirst ▶ gas and colic ▶ stools and constipation ▶ demand feeding, frequency of feeding ▶ breastmilk quantity <p style="text-align: center;">(see box 6 for related questions explored in subsequent focus groups)</p>	<ol style="list-style-type: none"> 1. In the first days, even though you have little milk, this is sufficient for the nutritional needs of your baby. 2. If your baby breastfeeds frequently, day and night, you will have all the milk that he needs. 3. If you fill the stomach of your baby with water or other milks, the baby will not have room for mother's milk that he needs. Many people will tell you to give <i>aguítas</i>; you have the right to say no! 4. If you think your baby is thirsty, give him breastmilk more frequently. This contains the quantity of water that the baby needs. 5. <i>Aguítas</i> do not solve the problem of colic. On the contrary, they can make it worse. Breastfed babies have colic less frequently than babies who take a bottle. 6. Correct positioning of the baby ensures that he breastfeeds well and that your nipples do not get hurt. 7. To avoid your breasts from getting hard, breastfeed your baby more frequently. 8. Breastfeed your baby even if you are sick. 9. The mother who breastfeeds needs to eat more of the same foods that she normally consumes. 10. Until 6 months, your baby needs only breastmilk. From then on, in addition to breastmilk, you should give him other foods.

During December and the first part of January, NCP staff and consultants reviewed the final results of the ethnographic research and KAP surveys. Based on these additional data from the baseline research NCP identified a series of issues that required further research to better understand mothers' practices and attitudes in order to sharpen the messages. These issues (shown in box 6) were to be addressed through focus groups with new mothers in each of the intervention hospitals that would be conducted with assistance from Ms. Koniz-Booher during her second technical assistance visit in early February 1989. Perú-Mujer was asked to revise the drawings and prepare mock-ups of the 12 flip chart counseling cards that would then be subjected to further testing through the focus group mothers.

Based on the issues identified by NCP, Ms. Koniz-Booher prepared a focus group guide with a series of questions concerning specific breastfeeding-related concepts and vocabulary related to the issues shown in box 6 and the depiction of target behaviors on the counseling cards. Two focus groups with new mothers were conducted in each of the two intervention hospitals. The Perú-Mujer communication coordinator facilitated the discussion, while Ms. Koniz-Booher and the artist recorded responses and observed mothers' reactions. The project director also participated in the sessions, which proved helpful in improving communication between the project training team and the Perú-Mujer materials production team. The participation of the artist in the focus groups was also pivotal, as it was the first opportunity that she had to directly observe mothers' reactions to the artwork and allowed her to better appreciate the need for certain changes in the drawings.

The new round of focus groups provided important additional insights into mothers' practices uncovered during the ethnographic research and guided the team in developing the final list of messages. Mothers reported that *aguitas* are frequently introduced as early as two or three days after birth, predominantly using a bottle. Mothers believed that *aguitas* aid digestion and can alleviate colic and gas. The focus groups indicated that other treatments for colic and gas were not known. Many mothers also felt that *aguitas* were especially necessary during the heat of summer and that breastmilk alone could not satisfy their babies' thirst. Several mothers said that they had used, or would consider using, a spoon or cup rather than a bottle for *aguitas*, but the majority expressed some reluctance.

Many mothers felt that it was appropriate to put the infant on a feeding schedule at as early an age as possible, often by two or three months. Most mothers felt that the best way to increase milk production was by drinking more fluid. Few mothers believed that they would make more milk if they nursed more frequently.

None of the mothers realized that it was important that the baby have as much of the areola in the mouth as possible, and most stated that the baby should only suck on the nipple itself. Most mothers believed it was difficult or dangerous to lie down to nurse their babies and so preferred a sitting position. None of the mothers interviewed realized that it was important to break the suction between the baby's mouth and the breast if nursing had to be interrupted, stating instead that they would simply "pull" the baby off the breast.

Box 6

Key Questions Explored in the Focus Groups

Use of water and teas (*aguitas*)

- How frequently, in what quantity, and in what type of receptacle do mothers give their infants *aguitas*?
- When are *aguitas* given in relationship to breastmilk, and do mothers actually substitute *aguitas* for a breastfeed?
- Do mothers believe that breastmilk can satisfy thirst, even during the heat of summer, or do they believe that additional liquid is necessary? How do mothers know that their babies are thirsty?
- Are mothers convinced that *aguitas* really help their infants with colic or gas, and if so, are specific *aguitas* used to alleviate these problems?
- Could mothers be convinced that sips of *aguitas* by spoon would be better than by bottle — that in fact, *aguitas* in bottles often cause or contribute to colic or gas?
- What other treatment for colic and gas can be promoted instead of *aguitas*?

Concerns over insufficient milk

- Do mothers believe that it is appropriate to put an infant on a feeding schedule, and if so, at what age do they begin to establish a regimen?
- Do mothers believe that you can increase milk production, and if so, how?
- Can mothers be convinced that the best way to increase milk production is to nurse the baby “on demand” — both day and night? Is there a word or expression for “on demand”?
- Can mothers be encouraged to consider only giving breastmilk and to avoid giving anything in bottles or using pacifiers?
- Can mothers be convinced that they should continue nursing when either they or their infant is ill?
- Do mothers know about growth spurts and that putting the baby to the breast more frequently will help build a mother’s milk supply over a period of a couple of days?
- At what age do mothers believe that it is necessary to begin feeding the child foods other than breastmilk?

Correct positioning of the baby and breast care

- Do mothers know that it is important that babies have as much of the areola as possible in their mouths, rather than suck on just the nipple itself?
- Do mothers know that they can lie down to nurse their babies, or do they believe that they should always assume a sitting position?
- How do mothers take the baby off the breast if they have to interrupt a nursing? Do they know how to break the suction?
- Do mothers know that it is better to alternate breasts during a feeding?
- How prevalent are sore or cracked nipples, or “hard” breasts? What do mothers normally do to treat these problems?
- How often do mothers believe that it is necessary to wash their breasts? What do mothers use to clean their nipples?

The majority of mothers who had nursed previous children had experienced either sore or cracked nipples, and several had suffered “hard” breasts. Many of these mothers stated that they had not known what to do about these problems. Washing the breasts was thought to be important, but few mothers actually did so regularly before nursing. Several mothers, however, did state that it was important to use soap on the nipples or to occasionally clean their nipples with alcohol.

The analysis of the focus groups results was also carried out as a team activity, in which the following strategic decisions were made based on the mothers’ responses:

- ▶ Incorporate messages that discourage the use of *aguitas* in as many of the counseling cards as possible;
- ▶ Emphasize in messages on several counseling cards that the best way to produce sufficient milk is to breastfeed on demand, both day and night;
- ▶ Eliminate the two counseling cards dealing with washing of the breasts and breastfeeding during illness of the child in order to reduce the number of cards to 10 and to focus on the most critical messages;
- ▶ Modify the proposed format of the flip chart by enlarging the drawings and placing messages to be delivered by hospital personnel on the back of the preceding card rather than on the front of the corresponding card;
- ▶ Modify the drawings to reflect appropriate positioning of the baby at the breast, comfort of the mother, participation of the father in the breastfeeding process, and emphasize appropriate positioning in several cards; and
- ▶ Modify language to eliminate all technical terms (such as areola) and use formal (*usted*) rather than informal (*tu*) address.

Box 7 provides an example of how the focus group results directed decisionmaking about the final messages and how these should be presented in the materials.

The Perú-Mujer production team modified the messages for the 10 counseling cards accordingly, and then met with the project director and the training team to present the results of the focus groups, the proposed detailed messages for each card, and the draft artwork and proposed formats for the three print materials. The training team suggested minor modifications in wording, approved the artwork formats, and participated in selecting the final 10 messages (shown in table 2) to accompany each drawing on the poster/calendar.

In summary, the process of message refinement for the project made extensive use of ethnographic, baseline KAP and focus group research to explore attitudes underlying feeding practices and determine which beliefs and behaviors could be modified through educational messages. The process was facilitated by having set clear behavioral objectives at the outset and deciding to narrow the communication strategy's focus.

Box 7
An Example of Strategic Decisions in Message Development

<i>Research Finding</i>	<i>Strategic Decision</i>	<i>Effect on Message and Print Material Development</i>
Mothers believe <i>aguitas</i> alleviate colic and gas.	Tell mothers to drink herbal teas themselves and that this will help the baby.	Card shows mother drinking tea; back of card includes message to be delivered by the health worker to instruct mothers to drink <i>aguitas</i> themselves for the beneficial effects to help the baby.
Mothers believe that substances they consume pass through breast milk to infant.	Emphasize in the main message that <i>aguitas</i> do not alleviate colic or gas, rather they can make it worse.	A list of other alternative measures to treat colic is included on back of the card.

Evaluation Results:

At two weeks of age, intervention mothers were less than half as likely as control mothers to rely on medicines to relieve colic (28 and 31 percent in Cayetano Heredia and Dos de Mayo versus 71 percent in the control hospital.) It is hypothesized that this follows from the fact that intervention mothers were exposed to alternate methods of treating colic.

A subsequent WHO-funded project which further tested the approach of having the lactating mothers drink the tea, then breastfeed the child found the strategy to be "very well accepted" (Creed de Kanashiro and Fukamoto 1992.)

Design and Implementation of the Training for Hospital Personnel

The training course for hospital personnel consisted of 20 hours of instruction and was modeled after the Wellstart Lactation Management Program curriculum, giving explicit focus to the promotion of exclusive breastfeeding and to sociocultural factors affecting breastfeeding in Peru. Auxiliary nurses, who were considered to be the hospital personnel with the most extended contact with mothers, were given an extra day of training in the use of the flip chart to counsel mothers and in how to demonstrate appropriate breastfeeding techniques to the mother with her own baby. The training was designed and conducted by a five-member interdisciplinary team of Peruvian health professionals (comprised of a pediatrician, an obstetrician, two nurses and one other health professional) who had attended the two-and-a-half week Wellstart Lactation Management Course in San Diego, in January 1989. Universidad Cayetano Heredia issued certificates for one course-hour of academic credit to all those who attended the full 20 hours of training.

The schedule for implementing the training course varied according to the situation in each

intervention hospital. At Cayetano Heredia, the training was conducted daily from 12 noon to 2 p.m. over a two-week period, using the time slot of the pediatric residency clinical seminar. At Dos de Mayo, the course was held from 8 a.m. to 2 p.m. on three consecutive days. The course was held twice in each hospital. Some 92 staff members at Cayetano Heredia and 142 at Dos de Mayo attended the full course, with 67 and 75 additional staff at each hospital, respectively, attending parts of the course. While the training was designed to be given jointly to the different types of staff, in Dos de Mayo, the obstetricians refused to participate in the same course with auxiliary nurses. A separate seminar series was organized for obstetricians at Dos de Mayo, although it could not be scheduled until after the project evaluation was completed.

Production of Print Materials

As part of its contract with NCP, Asociación Perú-Mujer provided camera-ready artwork for each of the three print materials and prepared technical illustrations for the health workers' guide, including the 10 drawings used in the flip charts.

Because only a limited quantity of the flip charts were needed, the images were silk-screened in color with the reverse side of each card printed in black and white. The cards were laminated and fastened together with two metal rings. The health workers' guides were printed in black and white with a blue and pink cover. The poster/calendars were printed with a colored background and border, with the 10 images from the poster and the central photograph appearing in black and white.

NCP funded printing of additional copies of the health workers' guide for distribution in Peru and to USAID Missions in Ecuador, Bolivia and Colombia as well as to other agencies working in breastfeeding promotion in Latin America.

Lessons Learned

NCP identified the following lessons from its participation in the development of the IEC component of the Peru Breastfeeding Project:

- ▶ The baseline research on mothers' beliefs and practices and health personnel KAP was essential for the development of the communication strategy and appropriate breastfeeding messages.
- ▶ The focus groups used to explore message concepts enabled the study team to pinpoint critical breastfeeding-related behaviors that were most susceptible to change and the attitudes and beliefs associated with them. The communication strategy's emphasis on modifying a few specific behaviors (such as discouraging the early introduction of water) enhanced the effectiveness of the educational materials.

- ▶ Local production teams do not necessarily have capabilities in applying social marketing techniques to message and materials development and can benefit from timely technical assistance in this area, especially regarding pretesting and focus group techniques.
- ▶ A team approach, integrating both researchers, technical specialists and communications professionals in the process of testing concepts, messages and prototype materials with the target audience, results in improved strategies and products.

IV. IMPLEMENTATION ACTIVITIES

Description of the Breastfeeding Promotion Intervention

The breastfeeding promotion intervention consisted of two main activities: 1) counseling and breastfeeding promotion by personnel in the obstetrical and neonatal services of the two intervention hospitals, using the flip chart and poster developed by the project; and 2) distribution of a poster-style calendar to all mothers delivering at the two intervention hospitals during the study period.

The in-depth training on exclusive breastfeeding and lactation management given to personnel in the two intervention hospitals was intended to overcome the serious knowledge gaps detected among hospital personnel in the baseline KAP survey. The print materials were intended to support health personnel in effectively counseling mothers and enable them to provide mothers with accurate and relevant advice on optimal breastfeeding techniques. The take-home poster/calendar given to mothers was intended to reinforce key messages after they had left the hospital.

Use of the Materials in Training of Health Workers and Education of Mothers

The breastfeeding guide for health personnel was distributed to all health workers who attended the training courses sponsored by the project. Auxiliary nurses were given an extra day of training apart from the 20-hour course to practice using the flip chart in counseling mothers and demonstrating appropriate breastfeeding technique to the mother with her own baby.

Approximately a dozen flip charts were placed in each intervention hospital for shared use by medical and nursing personnel in the various departments that served pregnant and lactating women (such as obstetrics, pediatrics, outpatient prenatal control, outpatient growth and development).

Some 7,000 poster/calendars were printed to provide for distribution to all mothers delivering at the two intervention hospitals from mid-1989 through mid-1990. One innovation included in the intervention was to ask nursing personnel to write on the calendar the actual date when the mother was to begin introducing other foods and liquids to the infant's diet. Of the mothers followed-up after their hospital discharge, 95 percent of those delivering at Cayetano Heredia and 46 percent of those delivering at Dos de Mayo reported receiving the poster.

Lessons Learned

A number of problems with the use of the educational materials were detected in the follow-up evaluation that need to be addressed in the design of future interventions. These related primarily to the failure of some health personnel to apply their increased knowledge to the counseling of mothers and diminished use of the materials over time as hospital staff turnover reduced the number of personnel knowledgeable about the materials. The findings of the follow-up

evaluation underscore the importance of actually assessing how personnel are applying in their daily activities the knowledge and skills acquired in training. Also of importance is the need for periodic training of new staff as they enter the system.

IV. EVALUATION & PROJECT IMPACT

Evaluation Strategy

The project's evaluation strategy focused on documenting changes in health workers' knowledge, attitudes and practices as a result of the training and on evaluating the extent to which mothers' infant feeding practices (especially exclusive breastfeeding) were modified by the educational intervention. The changes attributable to the intervention were to be based on statistically significant differences detected between the intervention hospital groups and the control hospital group. The evaluation plan included a repeat KAP survey of personnel in the three hospitals and a 12-week prospective follow-up of mothers who had delivered in the three hospitals during the intervention stage. Although not part of the original project evaluation strategy, NCP conducted an assessment of hospital practices in the two intervention hospitals 22 months after the project ended.

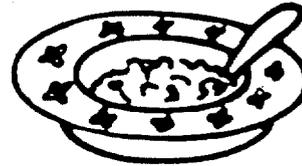
Evaluation Plan of Peru Breastfeeding Project

A self-administered questionnaire was completed by 327 health personnel from the three study hospitals approximately nine to 11 months following the training intervention. The questionnaire measured health worker knowledge and attitudes about breastfeeding. In addition to the health personnel KAP survey, the study also measured the average time between delivery and the first breastfeed for the mothers included in the prospective follow-up.

The prospective follow-up of 360 mother-infant pairs (120 from each hospital) provided the basis for the educational intervention's impact evaluation. Mothers who had vaginal deliveries without complications were recruited and interviewed in the postpartum ward to participate in the 12-week follow-up, which entailed four interviews in the home at two, four, eight, and 12 weeks postpartum. Mother-infant pairs entered the follow-up study at a rate of about 10 per week per hospital. In each home visit, the mother was asked about the infant's feeding (through a 24-hour dietary recall) to determine what foods and liquids were being given to the infant, as well as whether she was experiencing any difficulties with breastfeeding and whether the woman or the infant had experienced any illness. Mothers were also asked how they had handled problems

Figure 4

**El bebé debe recibir
otros alimentos a partir
del mes de:**



*Calendar allows health worker to fill in date
when complementary feeding should start*

with baby's thirst and colic. During the first home visit (at two weeks postpartum) the mother was asked about what type and sources of information and assistance she had received related to breastfeeding and infant feeding during her hospital stay. Sociodemographic and household economic information was also collected at that time to establish comparability of hospital populations and to determine possible associations of outcome data with socioeconomic variables. At four and 12 weeks, the infant was also weighed and measured.

The main results from this part of the project evaluation are summarized below. A more detailed discussion, prepared by the project director, can be found in her report to the Population Council (Altobelli 1991b), as well as her summary in the appendix.

NCP Follow-up One Year after Project Completion

A year after the Peru Breastfeeding Project ended, USAID/Peru requested that NCP conduct a follow-up assessment in the two intervention hospitals to determine the extent to which the breastfeeding educational materials were still being used in each hospital. AED Communications Specialist José Mata and local consultant Dr. Sarah María Vega spent a week in Lima in February 1992, visiting the two intervention hospitals. In each hospital, they observed health personnel interactions with pregnant and postpartum mothers and carried out semi-structured interviews with health providers and open-ended informal interviews with mothers. They also conducted one focus group discussion with midwife interns at Dos de Mayo hospital, taking advantage of a meeting organized for another purpose.

KAP Changes in Health Personnel

The baseline KAP survey had found low levels of knowledge of appropriate practices for establishing breastfeeding and of the timing of supplementation. Most hospital personnel thought that water should be given to infants in addition to breastmilk, with 64 percent indicating that water should be given in the first week of life. There were also a great many misperceptions about contraindications to breastfeeding, and poor awareness of how to prevent and manage common problems experienced by mothers with breastfeeding. Staff at Cayetano Heredia were generally better informed than personnel at Dos de Mayo and Loayza hospitals.

The post-training survey found sharp improvements in the intervention hospitals in health personnel knowledge of the inappropriateness of giving water in the first hours of life, which was a key focus of the training intervention based on the knowledge deficiencies found in the baseline survey. At the post-intervention measurements, only 12 percent of personnel at Cayetano Heredia and 8 percent of personnel at Dos de Mayo recommended water or glucose solution in the first hours of life, as compared with 54 percent of personnel surveyed at Loayza. Similarly, the proportion of staff that recommended giving water or formula in a bottle declined from 37 percent to 15 percent among Cayetano Heredia staff and from 70 percent to 18 percent among Dos de Mayo staff, while the proportion slightly increased among Loayza staff (from 68 percent to 74 percent). When health workers were asked at what age they recommended that mothers begin giving water to the infant, the average response of personnel in the intervention hospitals

rose to around 20 weeks, a marked increase over baseline levels of one to 10 weeks, while no change was seen in responses from personnel in the control hospital (see figure A1 in the appendix).

The study also detected an improvement in the average time between delivery and the first breastfeed in one of the intervention hospitals, Dos de Mayo. The average number of hours until the first breastfeed dropped from 15.3 to 6.2 hours after the training intervention in Dos de Mayo. The average time remained about the same in Cayetano Heredia and Loayza hospitals. This decrease was attributed to an important change in the attitude of obstetric staff at Dos de Mayo, who, after the training, were much more cooperative with neonatal staff in facilitating breastfeeding in the delivery and recovery rooms. Prior to the intervention, breastfeeding was not permitted in the delivery area.

Results of the Prospective Study of Mothers

Exposure to the Project Intervention

A high proportion of mothers interviewed were exposed to breastfeeding counseling in the hospital, with substantial differences found between the level and quality of exposure in the intervention hospitals and that in the control hospital. Some 90 percent of mothers at Cayetano Heredia and 75 percent at Dos de Mayo received some verbal information on breastfeeding during their hospital stay, as compared with 40 percent of mothers in Loayza hospital. Nearly all mothers (95 percent) delivering at Cayetano Heredia received the intervention's take-home poster/calendar, while less than half (46 percent) received the poster at Dos de Mayo. No mothers in the control hospital received any take-home materials.

The proportion of mothers who received a talk on breastfeeding in which a colored flip chart was used was 86 percent in Cayetano Heredia, 61 percent in Dos de Mayo and 8 percent in Loayza. Mothers in the intervention hospitals were also more likely to remember having received information about appropriate infant feeding and breastfeeding techniques than were mothers in the control hospital (see table A3 in the appendix).

Practice of Exclusive Breastfeeding

Striking differences were seen in the prevalence of exclusive breastfeeding among the three hospital cohorts. At two weeks postpartum, 62 percent of infants born at Cayetano Heredia, 35 percent of infants born at Dos de Mayo, and 20 percent of infants born at Loayza were exclusively breastfed. By 12 weeks, the prevalence of exclusive breastfeeding remained high only among mothers who delivered at Cayetano Heredia, with 52 percent of mothers continuing the breastfeed exclusively, as compared with 17 percent and 8 percent of mothers who had delivered at Dos de Mayo and Loayza hospitals (see figure A3 in the appendix). The differences in prevalence of exclusive breastfeeding between the Dos de Mayo and Loayza cohorts were statistically significant until eight weeks postpartum, when the difference failed to reach significance.

When the relationship between exposure to the intervention and exclusive breastfeeding was examined, the study found a statistically significant relationship between exposure and the practice of exclusive breastfeeding only in the Dos de Mayo cohort at two and four weeks postpartum (see table A7 in the appendix). That is, after four weeks, the difference in prevalence of exclusive breastfeeding between those delivering at the hospital who had been exposed to some aspect of the educational intervention and those who had not been exposed was slight. No significant relationship was found between exposure and breastfeeding practice among women who delivered at Cayetano Heredia because nearly all mothers (more than 95 percent) were exposed to the intervention.

Use of Water and Teas

In the home interviews, mothers were asked specifically about whether they had given the baby *aguítas* and if so, for what reasons. The results (shown in tables A4, A5 and A6 in the appendix) underscore the apparent effect of the intervention messages (do not give *aguítas*, give breastmilk for thirst and for colic), particularly on mothers in Cayetano Heredia, the higher exposure hospital.

By two weeks postpartum, 63 percent of mothers who delivered at Cayetano Heredia and 41 percent of mothers who delivered at Dos de Mayo had not given the baby any other liquids, as compared with only 21 percent of mothers who delivered at Loayza. By 12 weeks postpartum, 52 percent of mothers who had delivered at Cayetano Heredia continued to refrain from using *aguítas*, while the proportion of mothers who had not given *aguítas* dropped to 17 percent among the Dos de Mayo cohort and to 8 percent among the Loayza cohort.

By 12 weeks postpartum, 24 percent of Cayetano Heredia mothers and 16 percent of Dos de Mayo mothers had given the baby breastmilk to relieve thirst, as compared with 5 percent of Loayza mothers. At the same time, 35 percent of Cayetano Heredia mothers, 62 percent of Dos de Mayo mothers, and 81 percent of Loayza mothers had given water or other milk to relieve thirst. With respect to treatment of colic, by two weeks postpartum, 28 percent of mothers who delivered at Cayetano Heredia, 10 percent of Dos de Mayo mothers and none of Loayza mothers gave breastmilk to relieve colic.

Findings of the Two-year Follow-up in the Two Intervention Hospitals

Training and Knowledge of Personnel

The NCP team found that, in general, the knowledge of health personnel in the two hospitals regarding breastfeeding technical concepts was very good. There was an apparent relationship between having been exposed to the project's training intervention and breastfeeding guide and more complete knowledge of appropriate breastfeeding practices. This correlation was most evident at Dos de Mayo hospital, where the project appears to have played a substantial role in increasing the knowledge of health personnel of the norms and techniques for successful breastfeeding. The impact was less evident at Cayetano Heredia, which already had a strong

tradition of rooming-in and breastfeeding promotion before the project.

The evaluators observed that there has been a great deal of staff turnover in the two hospitals since the project ended, such that many personnel in the obstetric and pediatric services had not received in-depth training in lactation management. As a result, there was evidence of a lack of standardization in certain concepts, which translated into conflicting messages given to mothers. In neither hospital was there any formal or informal system for training new personnel in lactation management or for refresher training for existing personnel. Physicians tended to have the most complete knowledge of technical issues in breastfeeding, yet were the health providers least likely to discuss breastfeeding with mothers.

Use of the Print Materials

The flip chart developed by the project was being used in several areas of the hospitals, primarily for group talks with pregnant women and pre-discharge talks with groups of postpartum women. In most cases, those using the flip chart appeared not to have received specific training in its appropriate use, resulting in difficulties in coordinating the messages with the drawings on the cards. Personnel using the flip chart complained of problems with the design of the flip chart itself (weight, ability to manipulate easily, size) as well as with the negative character of the messages. In some cases, the flip chart was being used for large group talks and was too small for the images to be seen by all the participants.

Many health personnel still possessed the guide for health workers, but it was unknown to most personnel who had not participated in the project's training. No copies of the guide were readily available for reference by newer personnel. Those with copies of the guide tended not to loan them for fear of losing the document. Personnel interviewed by the NCP team expressed interest in having access to current information on breastfeeding.

Copies of the poster developed by the project were in evidence in several areas of the hospitals (often with hand-coloring and removal of the outdated calendar portion) but typically placed in locations where they were not clearly visible to patients. The two hospitals did not provide any take-home material on breastfeeding to mothers. In Dos de Mayo, however, a comic book on breastfeeding (part of a series of comic books on child survival topics that was produced by the Ministry of Health and UNICEF) was circulated among the mothers on the postpartum ward each afternoon and collected again at the end of the day.

Breastfeeding Education and Counseling Activities

The NCP evaluators observed that there are many opportunities for breastfeeding counseling in the hospitals: the prenatal education sessions, the postpartum ward, the pre-discharge talk, the neonatal ward, and the outpatient growth and development and pediatric clinics. The conclusion of the evaluation was that these opportunities were not being well utilized to address mothers' concerns and doubts and instill proper breastfeeding techniques.

The information imparted to mothers in talks typically emphasized the advantages of breastfeeding and the importance of exclusive breastfeeding in the first six months, but gave little time to practical issues in how to correctly breastfeed a baby and how to overcome difficulties with breastfeeding. Health personnel tended to offer useful breastfeeding advice only when solicited by the mother and were not proactive in identifying difficulties and addressing them. Personnel tended not to correct poor positioning of infants at the breast, or take the initiative to show mothers how to correctly place the baby, using the mother's own infant.

Conclusions on Project Accomplishments

The project was successful in achieving marked improvements in health provider knowledge of appropriate infant feeding practices, particularly regarding the inappropriateness of giving water, other liquids or bottles to young infants and the importance of encouraging exclusive breastfeeding through six months of age. However, this improved knowledge did not always translate into effective counseling of mothers, as illustrated by the lower levels of exposure to the educational intervention among mothers at Dos de Mayo hospital.

The project's most significant accomplishment was the relatively high prevalence of exclusive breastfeeding attained among mothers who delivered at Cayetano Heredia, the intervention hospital with the most complete and intensive intervention among both health providers and mothers. This high level of exclusive breastfeeding among the Cayetano Heredia mothers demonstrated remarkable stability over time, with only a slight drop in prevalence from four to 12 weeks of age. In contrast, the level of exclusive breastfeeding dropped sharply after four weeks postpartum among mothers in the second intervention hospital to a level closer to that of the control hospital. These findings suggest that the intervention as designed was highly effective, but only when it was fully implemented.

The follow-up evaluation carried out by NCP in the two intervention hospitals in early 1992 demonstrated that while important changes had occurred in the two hospitals as a result of the intervention, both facilities continued to experience problems with inadequate knowledge of lactation management among health personnel and limitations on breastfeeding counseling of mothers. Personnel experienced difficulties with the use of the flip chart (particularly those not trained as part of the intervention), and copies of the breastfeeding guide for health personnel were not available for easy reference by new personnel. No take-home print materials with breastfeeding information were available for mothers. The evaluation concluded that while the project demonstrated impressive gains during the intervention period, by some 32 months after the training took place, conditions no longer existed in the two hospitals to facilitate consistent breastfeeding counseling of mothers.

V. LESSONS LEARNED

Effective Use of the Social Marketing Process for Message and Materials Development

The Peru Breastfeeding Project proved to be an excellent example of the usefulness of the social marketing approach for identifying and refining messages tailored to modify specific breastfeeding-related behaviors that were found to be susceptible to influence. The relatively short time in which the study was implemented testifies to the fact that the application of rapid assessment techniques and small scale focus groups can yield enormous insights in a fairly short amount of time.

Effective Use of Training for Health Personnel

The 20-hour course, supported by a thorough reference guide designed for hospital personnel, resulted in sharp improvements in health worker knowledge and attitudes that persisted long after the training activity itself. The overall effects of a one-time training activity in a facility are, however, limited due to staff turnover. Hospitals need to develop strategies for ongoing training of new personnel, as well as for refresher training of existing personnel for a training intervention to fully achieve its objectives.

Effective Counseling of Mothers

The study's evaluation found that increasing health workers' knowledge does not automatically translate into more effective application of that knowledge in the process of educating and counseling mothers as part of health care delivery. While the study focused on changing health workers' knowledge and attitudes and sought to facilitate communication with mothers by providing specific tools (the flip chart and poster), in practice improving the quality of education and counseling requires greater emphasis in training on improving health workers' counseling skills and, subsequent to training, ongoing monitoring and supervision of how health personnel are actually applying their knowledge in their routine service delivery activities. All hospital personnel with a role in instructing mothers need training in how to effectively use educational materials to counsel as well as how to take greater advantage of the different opportunities for counseling during the woman's hospital stay.

Sustainability of the Intervention

The follow-up evaluation of the project's long-term effects on practices in the intervention hospitals found that while the materials developed by the project continued to be used, conditions did not exist in the two hospitals to fully support effective education of mothers in breastfeeding. Ongoing training efforts and reproduction of the health workers' guide and mothers' take-home material are needed to sustain the effects of the project's intervention.

Recognizing this need, the Peru Breastfeeding project director supported Cayetano Heredia faculty to seek funding for the creation of a permanent center to implement lactation management

training for hospital personnel in Peru. While the proposal was not funded, the study did achieve the formation of a multidisciplinary master trainer team in lactation management. This team was subsequently able to assist other hospitals in Lima with developing training in lactation management.

This proposal is feasible, given the already-formed multidisciplinary master trainer team in lactation management, and the already-developed training program and educational materials tailored to the needs of health professionals and mothers in Peru.

By 1993, the Ministry of Health and USAID/Lima provided funding for lactation management training through the Universidad Cayetano Heredia. The project, which had two parallel training components, was entitled "Training of Health Personnel in Clinical Management of Children with Diarrhea or Acute Respiratory Infection and Management of Breastfeeding and Weaning" (also known as PROCAME II). The project ran from October 1993 to April 1995. Referring only to the breastfeeding and weaning component, this project provided clinical training in breastfeeding management and weaning to four-person teams of trainers from approximately 50 Ministry of Health hospitals nationwide. By early 1995 those teams, in turn, had trained more than 5,000 other hospital, health-center, health-post and community personnel in exclusive breastfeeding and proper weaning practices. PROCAME II course instructors included all the Wellstart-trained personnel from the Peru Breastfeeding Project, in addition to several other newcomers. Both the guide for health personnel and the flip chart, produced for the Peru Breastfeeding Project, were reprinted in the amount of 4,500 and 200 copies, respectively, and distributed to all trainees.

The PROCAME II project was also called upon to provide a course on breastfeeding and weaning for faculty members from university-level educational programs for professional midwives, with the goal to incorporate a breastfeeding and weaning module in the curricula. This additional activity was funded by Wellstart International through the Population Council.

Other sources of funding are presently being sought by PROCAME to continue activities in lactation management training, with continued use of the educational materials produced through the Peru Breastfeeding Project.

Replicability of the Intervention

The breastfeeding guide for health workers has been distributed widely in the Latin American region for use as a model educational tool for health workers. With funding from USAID's Latin America and Caribbean Bureau, copies of the guide were distributed throughout Peru and in Ecuador, Bolivia and Colombia. The guide was also used by the Ministry of Health of Honduras as a model for a breastfeeding reference guide, which they developed with NCP support. Within Peru, through both the PROCAME II project and the UNICEF Baby Friendly Hospital Initiative, a total of 9500 copies of the health personnel guide have been printed and distributed to health workers throughout the country, who in turn have trained other primary- and secondary-level health-care providers.

As was noted previously, NCP advisor José Romero conducted focus groups in Chiclayo and Arequipa Departments to validate among periurban mothers various breastfeeding educational materials that had been developed in Lima, including the flip chart developed for the Breastfeeding Project. The focus groups found that while some of the main messages of the flip chart were well accepted by the mothers, certain terms and images used as well as the sequencing of messages were not well understood. The conclusion drawn from the focus groups was that the breastfeeding educational materials directed at mothers would need to be revised for use among periurban populations in other parts of the country, which may hold sets of beliefs that differ somewhat from those held by the original target populations of mothers in Lima.

While educational materials oriented at health personnel offer the possibility of more generalized use in other settings (especially among health workers with similar training and functions), materials oriented at mothers may not be readily applied in different sociocultural settings. The focus groups conducted in Chiclayo and Arequipa underscore the importance of basing educational materials on the results of formative research conducted with the intended target population.

Recommendations for Future Training Activities for Health Personnel

The following recommendations on training were drawn largely from those made by the researchers from the Johns Hopkins and Cayetano Heredia universities. All of these recommendations have since been implemented in Peru by the PROCAME II project.

- ▶ A continuous system of in-service training (either through formal training sessions or informal coaching by trained personnel) for new personnel and refresher training should be established in each hospital to standardize concepts, update knowledge and maintain skills on an ongoing basis.
- ▶ Training activities should be done on the wards, involving mothers and infants in the training to demonstrate effective counseling and breastfeeding techniques.
- ▶ To follow-up training, a system needs to be put in place for ongoing monitoring and supervision of how personnel are applying the skills learned in training.
- ▶ The breastfeeding curriculum in medical and nursing schools should be reviewed, strengthened if appropriate, and coordinated with the knowledge and skills needs of breastfeeding counseling responsibilities at the facility level.

Recommendations for Future Breastfeeding Communication Activities for Mothers

- ▶ Given the large range of suboptimal breastfeeding practices existing in many populations, it is critical to identify and focus on those having the most deleterious public health consequences. Keeping down the number of messages is a key to success.

- ▶ Phasing of messages over time is required in order to address all important behavioral issues. Monitoring can help identify appropriate timing for introducing second and third tier behavioral objectives (such as elimination, “other milks”) once the key messages about eliminating water have taken hold.
- ▶ Educational materials for mothers and health workers should be developed based on formative research conducted with the target population to ensure that materials and messages are targeted at specific knowledge and behaviors, are feasible, and address beliefs and perceived constraints.
- ▶ The intervention strategy should place greater emphasis on enabling health personnel to more effectively communicate with mothers and to be more proactive in identifying appropriate opportunities to educate and counsel mothers.
- ▶ Materials that mothers can read while in the hospital as well as take home and share with other family members are particularly useful and should be included in the IEC strategy.
- ▶ A facility-based interpersonal communication strategy would be enhanced by mass media communication targeted to mothers. Mass media can also be effective in reinforcing the same messages in the general population, thus helping to build new community norms for how infants are fed.

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APPENDIX
Peru Breastfeeding Project
Selected Evaluation Results¹

The following describes selected results from a two-year intervention research project entitled "A Controlled Trial to Extend the Duration of Exclusive Breastfeeding among Low-Income Women in Lima, Peru," carried out by the Johns Hopkins University, the Universidad Peruana Cayetano Heredia, with the Academy for Educational Development providing assistance for the IEC component. Funding was provided by the Population Council and USAID. (See Altobelli 1993 for the full evaluation report.)

Results of the post-intervention KAP survey of health personnel, which took place nine to 11 months following the training courses, showed extraordinary improvements in key areas of knowledge in lactation management in both intervention hospitals, with little or no change among control hospital personnel.

Before the intervention, Cayetano Hereida Hospital had more informed responses than the other two hospitals: physicians, nurses, and auxiliary nurses responded, on average, that mothers should

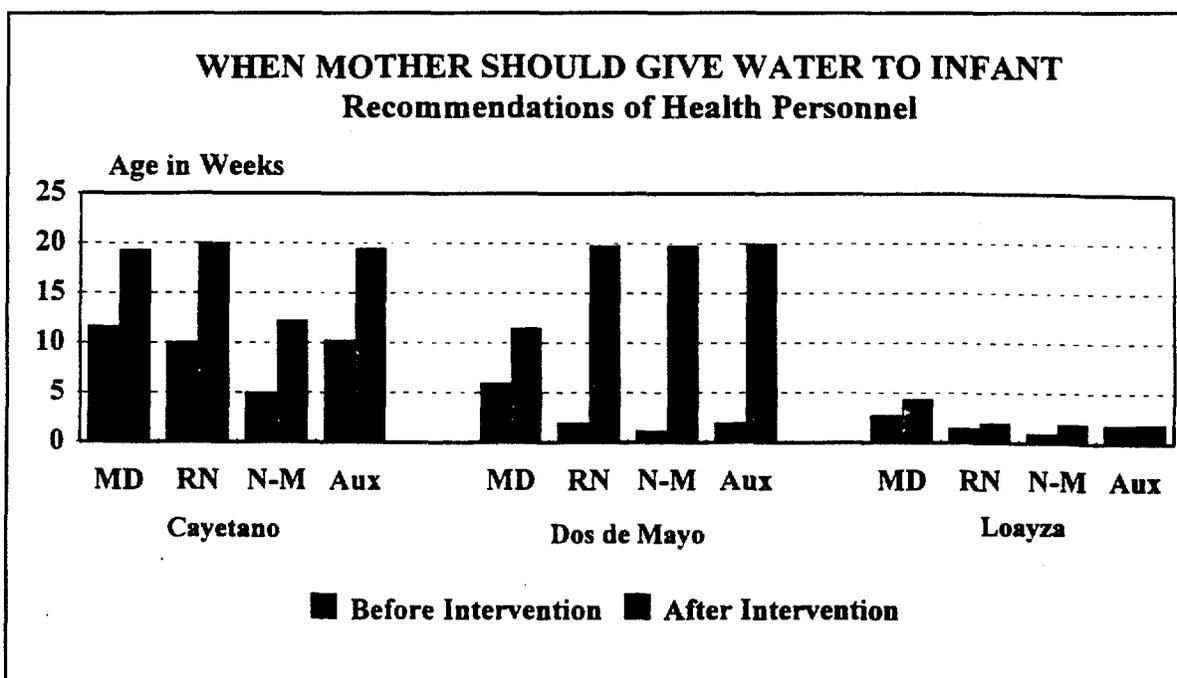


Figure A1

¹ Excerpted from Altobelli, Laura C. Development of Complementary Training and Educational Materials on Exclusive Breastfeeding in Peru, pp. 139-147 in The Proceedings of an International Conference on Communication Strategies to Support Infant and Young Child Nutrition. Peggy Koniz-Booher, Editor. Cornell International Nutrition Monograph Series, Numbers 24 and 25. Cornell University. 1993.

personnel was done nine to 11 months *following* the training intervention. Similar improvements were seen in the intervention hospitals on responses about need for water in the first hours of life, the need to give water to infants in the heat of summer, and so forth.

A baseline rapid ethnographic survey of 80 mothers of children under age five revealed beliefs and attitudes behind inappropriate breastfeeding and weaning practices. For example, Table A1 shows the main reasons reported by these mothers as to why they introduced water or teas to infants at an early age. The total number of responses add to more than 80, as mothers were first asked for reasons why they introduced water to their infant, then were asked to state any other reasons.

Table A1
Reasons for Introducing Water or Teas to Infant

<i>Reason</i>	<i>Number of mothers</i>	<i>Proportion of mothers</i>
Thirst	50	62.5
Colic or gas	48	60.0
Constipation	30	37.5
Dehydration	25	31.3
For digestion	22	27.5
Recommendation	12	15.0
Heat of summer	12	15.0
Other	<10	11.3
Total	80	

The results of the prospective study of a random sample of mothers who delivered in the three study hospitals are illustrated in the following figures and tables. Mothers were recruited and interviewed while in the hospital, and were visited at home at two, four, eight, and 12 weeks postpartum. Figure A2 demonstrates that the three populations of mothers were very similar in terms of their distribution on a scale of socioeconomic status. All study mothers were between the ages of 18 and 35, and had delivered a normal weight infant with a normal, uncomplicated delivery.

At their first home visit at two weeks postpartum, we asked study mothers specific questions about their recent hospital experience to determine how well the breastfeeding intervention was being implemented by hospital personnel in their interactions with mothers.

Table A2 shows that 90 percent of mothers in Cayetano, 75 percent in Dos de Mayo, and 40 percent in the control hospital had received any explanation about breastfeeding while in the hospital to deliver. Mothers reporting having received a talk in the hospital using a colored flip chart on breastfeeding included 86 percent of Cayetano mothers, and 61 percent of Dos de Mayo mothers, while 8 percent of control hospital mothers reported hearing such a talk. Ninety-five percent of Cayetano mothers reported receiving a poster/calendar on breastfeeding while in the hospital, compared with only 46 percent of Dos de Mayo mothers.

Table A2 shows that 90 percent of mothers in Cayetano, 75 percent in Dos de Mayo, and 40 percent in the control hospital had received any explanation about breastfeeding while in the hospital to deliver. Mothers reporting having received a talk in the hospital using a colored flip chart on breastfeeding included 86 percent of Cayetano mothers, and 61 percent of Dos de Mayo mothers, while 8 percent of control hospital mothers reported hearing such a talk. Ninety-five percent of Cayetano mothers reported receiving a poster/calendar on breastfeeding while in the hospital, compared with only 46 percent of Dos de Mayo mothers.

These data suggest that nearly all Cayetano mothers were exposed to the 10 educational messages we designed to prolong the duration of exclusive breastfeeding. On the other hand, while hospital personnel from Dos de Mayo demonstrated a highly significant increase in levels of breastfeeding knowledge, this did not necessarily carry through to their behavior in educating mothers with key messages. There was a strong association between a mother's exclusive breastfeeding and her

**PROPORTION OF MOTHERS STATING EACH REASON FOR INTRODUCING
WATER OR TEAS TO INFANT**

Factor	No. of Mothers	%
Thirst	50	62.5
Colic or Gas	48	60
Constipation	30	37.5
Dehydration	25	31.3
"For digestion"	22	27.5
Recommendation	12	15
Heat of summer	12	15
Other *	<10	11.3
TOTAL	80	

* Includes to accompany medicines, baby crying, mother had little milk, so baby would sleep peacefully, to prevent allergies, saw other mothers doing so, "always need liquid," to rest from milk, mother had a cold or insomnia, "so kidneys would work," "when baby is fussy," "when baby has been frightened."

Figure A2

having heard a talk with the flip chart and having received a copy of the poster/calendar while in the hospital.

Study mothers were asked to name the three recommendations about breastfeeding that they most remembered having received during their hospital stay (table A3). Detailed coding and analysis of responses revealed that 60 percent of control hospital mothers received no information, or could not remember any information received, and that information received was likely to be simply about the superiority of breastfeeding. Some mothers

received information on correct use of other milks, and others on correct and incorrect breastfeeding techniques. Intervention hospital mothers were most likely to remember having received correct information on use of supplementary milks or waters and teas (that is that they should not be used), as well as benefits of breastfeeding and correct breastfeeding techniques.

Table A2
Number of Mothers Exposed to the Intervention
as reported at two weeks postpartum

	<i>Hospital:</i>		
	<i>Cayetano</i>	<i>Dos de Mayo</i>	<i>Loayza (control)</i>
Received any explanation about breastfeeding	90	75	40
Received a talk with the flip chart	86	61	8
Received the poster/calendar	95	46	0
N=	115	99	107

The final results of the study on the proportion of mothers by hospital who were exclusively breastfeeding at two, four, eight, and 12 weeks postpartum are shown in figure A3. Among mothers delivering at Cayetano hospital, as many as 52 percent were still exclusively breastfeeding their infants at 12 week postpartum. Dos de Mayo mothers had a statistically significant greater proportion of exclusive breastfeeders in comparison with the control hospital mothers through the fourth

week, after which the difference failed to reach significance. We can attribute some of the less successful results of Dos de Mayo as compared with Cayetano mothers to their lower level of exposure to the educational messages of the project via the flip chart and the poster/calendar, as shown earlier.

Table A4 shows the reasons why mothers gave water or teas to their infant, or if no liquids had been given. At two weeks postpartum, 63 and 41 percent of the two intervention hospital mothers had given no liquid, and only 21 percent of control mothers had given no liquid. Similar to baseline findings, thirst was the main reason why control hospital mothers had given liquids. At 12 weeks postpartum, 52 percent, 17 percent, and 8 percent, respectively, of mothers at the two intervention hospitals and the control hospital had not given liquids. Among those that had given liquids, the most frequent reasons was still thirst: this reason was given by 26 and 28 percent of intervention hospital mothers, but by as many as 70 percent of control hospital mothers.

To ask the question another way, we asked each mother at each home visit whether she thought the child had experienced thirst in the previous two-week period, and if so, what the mother did to relieve the thirst (see table A5). The result was that the proportion of mothers from the three hospitals who reported that their child had experienced thirst in the previous two-week period were very similar to the proportion of non-exclusive breastfeeders. This finding suggested that determining the influence that the perception of thirst has on abandoning exclusive breastfeeding.

Apparently, following the message transmitted with the educational materials used in the hospital,

Table A3
Recommendations Received by Mothers in the Hospital
as reported at two weeks postpartum

	Hospital:		
	Dos Cayetano de Mayo	Loayza (control)	
No recommendation	14	25	60
Benefits of breastfeeding	27	27	19
Correct use of other milks	59	40	16
Correct use of water and teas	38	10	0
Correct breastfeeding techniques	14	32	14
Incorrect breastfeeding techniques	2	16	16
Breastfeed when child is ill	10	1	1
Breastfeed when mother is ill	9	2	0
Maternal nutrition	2	2	2
Incorrect information	2	1	5
N=	117	101	111

USE OF WATER AFTER THE INTERVENTION

Peru Breastfeeding Project - JHU/UPCH

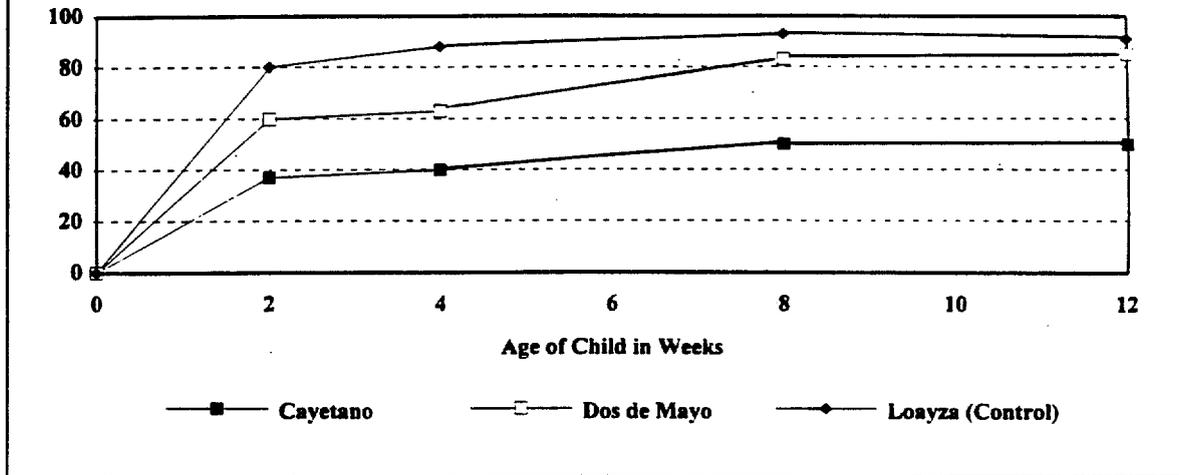


Figure A3

about 20 percent of mothers from both intervention hospitals gave breastmilk to relieve thirst, versus only 9 percent in the control hospital. By 12 weeks postpartum, only 35 percent of the Cayetano mothers had begun to give water for perceived thirst, as compared with 62 percent of Dos de Mayo mothers and 81 percent of control hospital mothers. Cayetano hospital mothers were apparently able to change their belief that infants need water because they are thirsty.

As opposed to thirst, which is more likely to be a perception in the mind of the mother, colic is more of a true phenomenon of which etiology we know little, but can be identified by a baby's incessant crying. Table A6 shows the distribution of treatments given to infants who had colic reported in the two weeks prior to the home visit interview. Similar numbers of infants in each hospital group were reported to have had colic.

At two weeks postpartum, intervention mothers were less than half as likely as control mothers to rely on medicines to relieve colic (28 and 31 percent in Cayetano and Dos de Mayo, compared with 71 percent in the control hospital). This difference could follow from the fact that intervention mothers had been exposed to alternative methods of treating colic as part of the flip chart messages. In addition, as many as 28 percent of Cayetano mothers actually gave breastmilk to treat colic — another part of our messages.

At 12 weeks postpartum, similar proportions (55 to 61 percent) of colicky infants in all hospitals

were given medicine. However, Cayetano mothers still persisted in giving either breastmilk or a neutral treatment in higher proportions than either Dos de Mayo of the control hospital mothers, suggesting a long-term effect of the educational intervention in the hospital on these mothers.

We wanted to see if there could be a statistical relationship between exposure to the educational messages, designed for this project and actual feeding practices of the mother. As seen in table A7, in Cayetano, the difference in proportions of exclusive breastfeeders between those mothers who were and were not exposed to the flip chart and the poster/calendar is not significant at

two, four, and eight weeks postpartum. This finding is mainly due to the fact that so few mothers were not exposed to the materials (about 10 percent), and these mothers at least received verbal information on breastfeeding.

Dos de Mayo Hospital did show significant differences between mothers who were and were not exposed to the educational materials. There is a descending strength of association from $p < .01$ at two weeks postpartum, to $p < .05$ at four weeks postpartum, to not significant at eight weeks. This declining association over time suggest that the hospital intervention was responsible for early strong difference at two weeks postpartum, but that other factors caused interference in the effect as time went on.

Table A4
Reasons why Mother gave Water or Tea to Infant

	Hospital:		
	Cayetano	Dos de Mayo	Loayza (control)
<i>Two weeks postpartum:</i>			
Insufficient milk	10	14	13
Thirst	10	8	36
Colic	7	17	10
Other	12	19	20
No liquids given	63	41	21
N=	115	99	107
<i>12 weeks postpartum:</i>			
Insufficient milk	6	8	2
Thirst	26	28	70
Colic	5	22	1
Other	13	23	20
No liquids given	52	17	8
N=	111	91	104

Table A5
What Mothers gave to Relieve
their Infant's Thirst

Hospital:

Dos de Loayza
Cayetano Mayo (control)

Two weeks postpartum:

Breast milk	19	20	9
Water or other milk	21	34	65
No thirst reported	60	46	25

12 weeks postpartum:

Breast milk	24	16	5
Water or other milk	35	62	81
No thirst reported	42	22	14

N=	110	90	104
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Table A6
What Mothers gave to Relieve
their Infant's Colic

Hospital:

Dos de Loayza
Cayetano Mayo (control)

Two weeks postpartum:

Breast milk	28	10	0
Natural treatment	14	24	10
Water	31	35	19
Medicine	28	31	71

N=	29	29	21
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12 weeks postpartum:

Breast milk	17	4	0
Natural treatment	10	8	10
Water	22	29	28
Medicine	52	58	61

N=	29	24	18
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**Table A7
Association
between Exposure to Materials
and Exclusive Breastfeeding**

Hospital:

*Dos deLoayza
Cayetano Mayo (control)*

Two weeks postpartum:

Breast milk only	59%	48%	0%
Water or other milk	83%	24%	19%
p value	na	<.01	-

Four weeks postpartum:

Breast milk only	57%	33%	0%
Water or other milk	67%	16%	12%
p value	na	<.05	-

Eight weeks postpartum:

Breast milk only	41%	17%	0%
Water or other milk	50%	9%	6%
p value	na	ns	-

Note: 12 weeks postpartum is not included in this table because the results are similar to week 8.