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Mali Nutrition Communication Project

1989 - 1995

FINAL REPORT

Nutrition Communication Project
May 1995



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MALI
NUTRITION COMMUNICATION PROJECT
1989- 1995

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Academy for Educational Development
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ACRONYMS

AED	Academy for Educational Development
CNIECS	National Center for Information, Education, and Communication
CREN	Nutrition Rehabilitation and Education Centers
DHS	Demographic Health Survey
DSF	Division of Family Health
FAO	Food and Agriculture Organization
HKI	Helen Keller International
IEC	Information, education and communication
KAP	Knowledge, attitudes and practices
MOH	Ministry of Health and Social Affairs
NCP	Nutrition Communication Project
TOT	Training-of-trainers
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VITAP	HKI Vitamin A Technical Assistance Project

EXECUTIVE SUMMARY

Mali is a landlocked West African country with a population of approximately 9.2 million. Located in the Sahel, climatic conditions are a chief cause of poor nutrition and health. Recurring droughts have regularly decimated herds of cattle and goats and destroyed millet and sorghum crops, the main dietary staples. Infant mortality is extremely high at 170 per 1000 live births; maternal mortality is 2000 per 100,000 live births. Seventy percent of infant and childhood deaths are attributed to malaria, measles, tetanus, respiratory diseases, diarrhea, and malnutrition, all preventable diseases. According to the 1987 National Demographic and Health Survey, the proportion of children 3-36 months showing signs of acute malnutrition (weight for height) was very high at 11% and chronic malnutrition (height for age) was about 25%. In Bamako, the capital, 15% of birth weights were below normal. Particularly in the north, vitamin A deficiency is a serious problem, with night blindness prevalent among 9.48% of six- to ten-years olds.

Overview

The USAID-funded Nutrition Communication Project (NCP) in Mali was designed to address the poor nutritional status of rural women and children through collaboration with ongoing health programs and an integrated approach to message delivery. Rather than create a free-standing nutrition education program, NCP worked with the Ministry of Health (MOH) and private voluntary organizations (PVOs) to build a nutrition emphasis (and introduce new communication materials and counseling activities) into their related programs—such as different child survival components, safe motherhood, and so forth. NCP placed heavy emphasis upon institutionalizing communication capacities within these PVOs and a central government organization. The National Literacy Service of the Ministry of Education was also an active partner, working with NCP to improve the nutrition curriculum in primary schools and to incorporate nutrition messages into adult literacy materials.

The six-year project (1989-1995) was carried out in cooperation with the Ministry of Health. The Academy for Educational Development initially collaborated with the Nutrition Service of the MOH. In late 1990 the National Center for Health Information, Education, and Communication (CNIECS) was formed, and gradually took on responsibility for leading the project. USAID provided \$874,779 to fund the project and UNICEF contributed \$220,000.

The project benefitted from cross-fertilization with NCP programs in Niger and Burkina Faso. Prototype communication materials were shared among the projects and adapted to fit the needs of varying audiences and message emphases. Joint training and eventually sharing of professional expertise through consultancies also contributed to building of capacities in the region.

The project took place in three phases:

Phase I: Program Development, 1989-1991. Major activities included audience research, a baseline survey, and strategy development together with the Ministry of Health and three PVOs, which became known as the Nutrition Network. Initial emphasis was upon development of a village-based counseling approach and preparation of a first round of educational materials.

Phase II: Expansion, 1991-1993. The project trained an expanded number of PVO Child Survival Project teams to mount nutrition communication activities. Results of the baseline KAP survey led to a refining of behavioral targets and development of additional communication materials. The Nutrition Network grew to include three government ministries, ten local and international PVOs, and several key donors including UNICEF.

Phase III: Consolidation, 1993-1995. Phase III focused on implementing the broadcast, primary school, and literacy strategies. During this period the Nutrition Network organized regular project planning meetings and responsibility for project implementation was gradually transferred to CНИЕCS. When NCP ended, UNICEF became the sole funding source of program activities, which continued under the new name, Communication Program for Family Well Being.

Objectives and Target Area

The overall project objective of improving the nutritional status of women and young children in rural areas was divided into three specific goals:

- improve maternal nutrition during pregnancy and lactation;
- sensitize parents to the importance of nutrition and improve their ability to feed children appropriately (including those who have been sick);
- promote consumption of foods rich in micronutrients, particularly vitamin A, among pregnant and lactating women, and among children who are 6-36 months old.

NCP activities were initially carried out in the Ségou region of Mali, approximately 200 to 300 miles east of Bamako, where the original three PVOs (CARE, Africare, and World Vision) were active. As the number of PVOs involved in the program grew, the intervention area also expanded into the regions of Koulikoro, Kolondieba, and Sikasso. The program eventually reached a population of about 760,000.

Audience Research

Qualitative

In December of 1989, NCP conducted ethnographic research in one PVO project site to examine the behavioral correlates of malnutrition and vitamin A deficiency in rural communities. In March of 1990, further qualitative studies included 16 focus groups and two market surveys. The

research looked at family dietary practices and related decision making, identified common vitamin A-rich foods, and studied appropriate communication channels. Key findings were that:

- Mothers delayed feeding most solid foods until children were nearly a year old, and knew of few measures to help sick children regain their strength following bouts of diarrhea and illness;
- Neither men nor women were very aware of women's or children's dietary needs; however, the "right" to good food was thought to be the prerogative of adults who had earned it;
- In villages where a child survival project had been active, the villagers were more aware of the relationship between "good food and good health," and more inclined to believe in their own abilities to prevent illness. In villages that had never participated in a child survival project, the villagers generally felt they had almost no control over their own health;
- "Night blindness" (the first clinical sign of vitamin A deficiency) was a widely recognized condition thought to occur normally in pregnancy. Villagers knew of several traditional remedies (including use, though not necessarily consumption, of animal liver).

Quantitative

The baseline Knowledge, Attitudes, and Practices (KAP) survey was carried out in three PVO sites (47 villages) in December of 1990. The project interviewed 835 women and 524 men and collected anthropometric indicators of 657 children's nutritional status. The survey found that malnutrition was pervasive among children under three. Only one in three newborns received breastmilk as a first food, and on average, complementary feeding was delayed until nine to ten months of age. Few children were supervised by adults while they ate. Regarding communication channels, 80 percent of women said that health workers were their primary source of nutrition information; more than half the men said they received health information via radio.

Strategic Planning

Strategic planning took place in two phases: after review of the qualitative research, and again after review of results from the KAP survey, when an original list of 14 behavioral objectives was refined to a smaller group of critical behavioral targets likely to show results within the time frame of the project. These were as follows:

- promoting "vitamin A-rich foods" as the prevention and cure for night blindness;
- emphasizing men's responsibilities for women's and children's nutrition;
- helping men and women make better food choices in the marketplace;

- promoting discrete child feeding behaviors (e.g., at least three supervised meals/day, use of a separate feeding bowl for children 12 - 36 months old, and recuperative feeding skills).

While exclusive breastfeeding through four months was viewed as critical, the PVO partners felt this behavior change was unlikely to be achieved in the project's initial time frame (Phase I). However, materials on exclusive breastfeeding were introduced when NCP was extended in 1992.

The NCP consortium also made five *tactical* decisions based on the research:

- Phase in nutrition communication following other health or social interventions such as immunization, oral rehydration therapy, or water and sanitation projects. Such improvements helped to establish motivation and self determination, two necessary elements for committing to nutrition behavior change, for which results were less readily apparent.
- Focus on increasing awareness of children's dietary *needs*, while leaving the more socially defined concept of children's *rights* alone.
- Use night blindness to help the target audience make the connection between *dietary intake* (eating enough red-orange or green leafy vegetables, etc.) and *good health* (the condition improves when the right foods are consumed).
- Direct some messages to intra-household resource allocation. Women in nearly every village had control over some resources, e.g., garden products, poultry, small commerce, milk sales, village technologies. In order to help women make independent dietary decisions, they must be made aware of their purchasing or bartering power. In the majority of cases, however, men controlled the resources. They needed to be encouraged to increase their financial contribution to maternal and child nutrition, or to purchase more nutritious foods themselves for their family.
- Use economic and social rationales for investing in women's and children's nutrition. Men could be persuaded to purchase nutritious low-cost foods for prevention, and more "socially-esteemed" and expensive foods, such as liver, for "cure."

Communication Channels

Emphasis on Interpersonal Communication

When the project began, NCP's child survival partners were already intensively involved in community mobilization activities. To build on this grassroots presence, NCP developed materials and provided training to strengthen the skills of field agents to identify community nutrition problems, choose appropriate kinds of communication, and use group activities to motivate and share information with communities.

Interpersonal and group counseling were the primary vehicles for reaching women; the project developed various supportive materials to help health agents bring messages to life. Men, on the other hand, were approached through village mobilization meetings, role plays, and radio. NCP designed and field-tested all media with participating PVOs before producing materials *en masse*.

The project began with a foundation of "village story books" presented in the form of flipcharts. NCP project teams in Burkina Faso and Mali collaborated on the development of an initial set of five flipcharts and a facilitator's guide. These used simple, cartoon-like illustrations which invited the audience to work through resistance points and then (indirectly) experience the benefits of new nutrition behaviors. A total of 650 sets of the flipcharts were produced, together with 125 copies of a facilitator's guide.

NCP developed counseling cards in 1993 at the request of PVO agents for materials suitable for pre-literate village volunteers. The consortium selected the ten most critical behaviors for emphasis. Colorful drawings based on photographs of Malians performing the promoted behavior were made into laminated counseling cards. Text on the back of the cards helped the PVO agent train the village volunteer—primarily through means of a short story related to the image. Village agents used both the flipcharts and the cards to animate discussions, develop role plays, and counsel mothers about children's diet. A total of 1,000 sets of the cards were produced.

Originally developed in Burkina Faso, a *carte familial*, or variation on the health card, included priority NCP messages together with illustrated stickers. Field agents placed stickers on the messages during counseling sessions to emphasize points discussed. A total of 5,000 sets were produced.

A three-part manual entitled *Communautes en Bonne Sante* aimed to help field-level workers understand basic nutrition concepts and strengthen techniques for working with both parents and community organizations.

Mass Media for Men

The key *mass* medium used by NCP was a dramatic radio series featuring a recalcitrant father who, with the advice of the community health agent and meddling of various village characters, manages to get and keep his family on the "Road to Health" through good nutrition. Ten episodes of *Saheli Sama*, the "Elephant of the Desert," were broadcast in July 1993. Prior to launching the drama, ten 30-second spots promoting priority behaviors were also developed. Following intensive consulting by rural radio experts, and creative re-vamping of the program by Malian playwrights, a revised broadcast was initiated in November 1994. The show proved to be so popular that the national radio station began broadcasting the series daily in February 1995.

Secondary Channels

Secondary project channels included child-to-child activities and post-literacy program materials. In early 1992, NCP began efforts to strengthen nutrition education in primary schools and through

non-formal educational programs. With UNICEF, the program created a Teachers' Activity Guide including classroom lessons and child-to-child activities. A set of three literacy booklets based upon nutrition themes was produced for new adult readers.

Training

The project put heavy emphasis on training, both because of its goal of institutionalizing communication capacities in ongoing PVO Child Survival Projects, and because of its focus on counseling as a primary channel for communicating messages at the village level. Training therefore fell into two broad categories: national strategy, planning workshops, and lessons learned workshops; and regional skills-building workshops.

National Strategy and Planning Workshops

- *Strategy Formation Workshop* (for Nutrition Network partners, to discuss results of formative research and plan initial behavioral goals and activities); June 1990.
- *Dissemination of KAP Findings, Strategy Re-formulation* (for Nutrition Network partners, to refine behavioral objectives); September 1991.

Regional Skills-building Workshops

- *Series I: Launching the Community-Based Model* (with Helen Keller International, trained 28 MOH and PVO personnel; introduced the field guide for health agents and four draft flipcharts); December 1990.
- *Series II: Individual Counseling* (for 60 PVO and MHO staff, introducing the Five-Step Counseling Approach. NCP aimed to foster an environment in which community workers would encourage parents to put a new health action into practice by listening closely to a parent's concerns, using teaching aids that fostered participation, and providing regular follow up. To promote effective interpersonal communication, the program developed a five-step approach to nutrition-related assessment and counseling. May 1992.
- *Series III: Working Within the Community* (for PVOs on group communication techniques and incorporation of the flipcharts into ongoing monthly activity plans); November 1992.
- *Series IV: Effective Community Mobilization* (for PVO field staff, introducing the health worker's field manual and the *carnet familial*); November 1993.
- *Series V: Introduction of the Teacher's Activity Guides* (for nonformal education programs); April 1994.
- *Series VI: Community Theater* (introduction of use of traditional theater in communication programs, by a consultant from the NCP/Niger team); October 1994.

In the regional workshops, PVOs were encouraged to incorporate new NCP approaches and materials into their village-based programs following each training event. The training workshop always concluded with a discussion or proposed intervention calendars, and individual agents setting performance goals. Following each workshop series, the CНИЕCS team conducted field supervision visits to selected sites to monitor nutrition communication activities. Over the course of the project, each of the ten PVO project partners were visited at least once.

Evaluation

At the time of the baseline survey in 1990, each of the three participating PVOs randomly selected eight villages from its active Child Survival Project to participate intensively in NCP, and eight villages (matched for socioeconomic and other factors) to act as "comparisons." In the comparison villages, all other child survival activities of the respective PVO took place (e.g., immunizations, oral rehydration therapy, safe motherhood, family planning, water hygiene) but NCP approaches and materials were not included.

After one year of intensive promotion, the project conducted a rapid assessment in one PVO site that needed to withdraw from the program for administrative reasons. The mid-term survey used the same protocol as the 1990 baseline survey but covered only eight of the original 16 villages sampled, or four NCP trial villages and four comparisons. The mid-term survey found that nutritional status among children ages 6-36 months was better in the four trial villages than the comparison villages, and it was also better than the villages' baseline measurements. This encouraged NCP to maintain its strategy.

Data to support an impact evaluation of NCP in Mali were collected between December 15, 1994, and January 15, 1995. The two remaining project sites from the baseline (in Ségou and Koutiala) and one additional PVO (in Kolondieba) participated in the survey. Approximately 450,000 people were involved in the NCP intervention in these areas. The survey included 702 women and 354 men (who responded to a series of questions including a 24-hour dietary recall) and 845 children three years of age and younger (who were measured).

Results

The survey results indicate that **NCP improved maternal diet, child feeding behavior and children's growth**. This is true whether the project's impact is examined over time (i.e., before/1990 and after/1994-95), or in relationship to the strength of a village or an individual's exposure to NCP media. All findings reported below are significant.

Impact Pre- and Post-NCP

- The prevalence of malnutrition (weight for age), was reduced from 38% to 28 % (a 26% reduction) in trial villages, while it remained virtually unchanged (1% point increase) in comparison villages.

- Chronic malnutrition, or stunting, was reduced from 46% to 31% (a 33% reduction) in the trial villages, while there was no significant change in comparison villages.
- Giving children colostrum (first breastmilk) more than doubled in trial villages (from 25% to 58%) compared to a 12 point change (30% to 42%) in comparison villages.
- The number of mothers in trial villages not giving infants water until after four months doubled over the baseline level (from 10% to 21%) compared to a 6 point change (11% to 17%) in comparison villages.
- Mothers in trial villages were far more likely to introduce porridge, fruit, green leafy vegetables, cow's milk, and meat or liver into a child's diets—and in a timely fashion—than mothers in comparison villages.

Impact in Relationship to NCP Exposure

There was a positive relationship between length of time a village participated in NCP and improvements in children's measurements. When multi-variate statistical techniques were used to examine these relationships, it appeared that:

- Children over six months of age were **twice as likely to have a satisfactory general nutritional status** (weight/age) if the child's mother *remembered two or more NCP counseling contacts or materials* ($p=.008$). Recalling NCP media was the only significant factor in an analysis that also included having been vaccinated, filtering water, and having a positive wealth measure.
- Using a similar analysis as above, children over six months of age were **3.4 less likely to be stunted** (unsatisfactory height/age) if the child's mother *remembered two or more NCP counseling contacts or materials*.
- Neither the presence of child survival activities alone, nor socioeconomic factors alone (particularly wealth indices), or a combination of these factors without NCP, were associated with improved nutritional status. This was tested in a multitude of ways. Sickness two weeks prior to/during the survey was the only variable associated with wasting.

NCP exposure was also highly correlated with increases in several promoted behaviors.

- Men purchased more healthy foods for women and children.
- Women and children consumed greater amounts of healthy foods.
- Caretakers reported better child feeding practices.

Lessons Learned

NCP's evaluation provides evidence that within rural, Malian communities, improvements in nutritional status do not require increases in household income and can be obtained with *low-cost* communications added to child survival programs. NCP improved the chances for approximately 750,000 people taking part in the community-based component of the program in Mali, while the radio broadcasts had the potential of reaching any Bambara speaker in the country (of 9 million people). The reduction in child malnutrition alone achieved through NCP activities is estimated to have prevented the deaths of approximately 850 children per year by the end of the project.

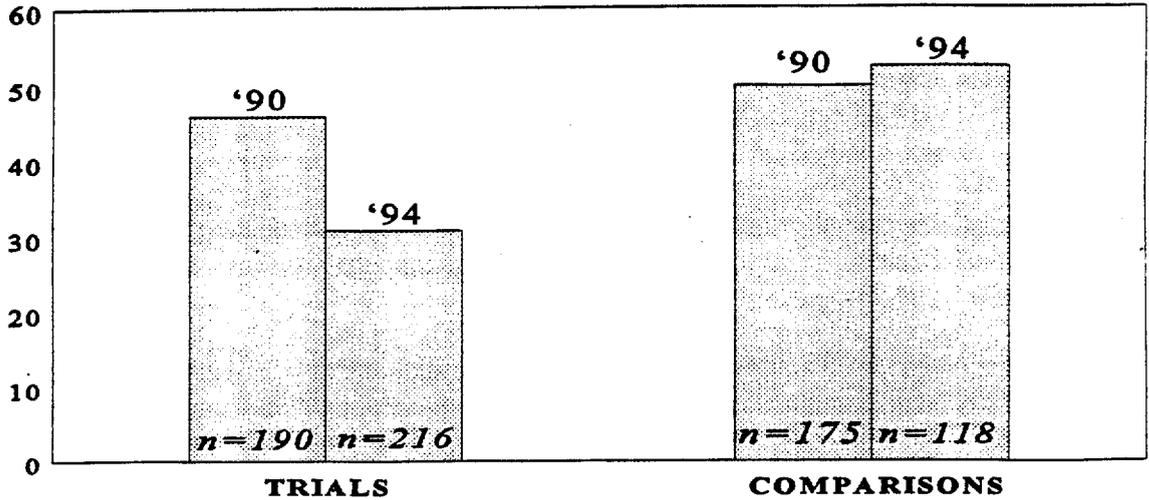
By linking up with ongoing programs, NCP was able to tap into existing momentum, reduce start-up time, and benefit from the foundation of trust and an environment favorable to change established by locally-active PVOs.

Successive series of skills-building workshops and a wide variety of educational materials enabled and encouraged community health agents to expand the scope of their community work to include nutrition. Counseling cards which complemented the flipcharts were used without difficulty by both literate and non-literate village volunteers. Volunteers reported that using the cards increased their credibility and prestige in the village.

NCP's project design, in which interventions were implemented by well-established international PVOs and then expanded to the MOH and other PVOs, facilitated the progressive transfer of responsibility for activities to national team members working within CНИЕCS. Following four years of collaboration, the technical capacity and the reputation of the CНИЕCS grew impressively. Since 1993, PVO health projects have increasingly turned to the CНИЕCS for assistance with materials development, radio production, and training.

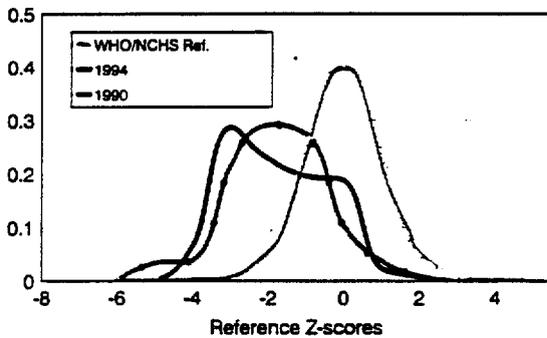
While funding for USAID's project in Mali ended in March, 1995, NCP activities continue under the direction of the National Center for Health Information, Education, and Communication (CНИЕCS), the Group Pivot for Child Survival (an NGO coordinating group, partially supported by USAID), and the network of PVOs, with additional support from UNICEF. Expansion of NCP activities with UNICEF funding has been a source of great encouragement to all members of the PVO/NGO Nutrition Network. With UNICEF support, the NCP strategy has been expanded to new regions of the country. New episodes have been added to the radio drama; print and training materials have been translated into new languages; and new initiatives have been built into the in-school activities launched by NCP.

Percent of Stunted Children



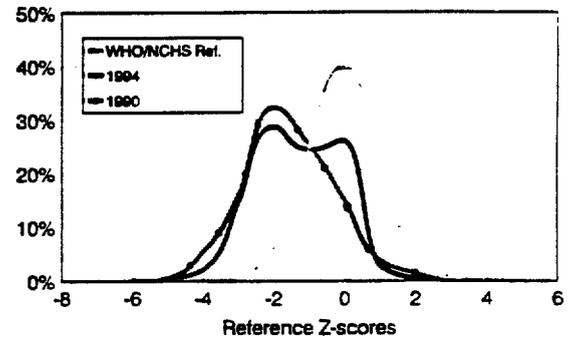
<-2 SD

Pre-Post Weight/Age Distribution
Comparison Villages 1990-1994



1990 N=182, Mean WAZ=-1.8, SD=1.3
1994 N=122, Mean WAZ=-1.8, SD=1.3

Pre-Post Weight/Age Distribution
Trial Villages 1990 - 1994



1990 N= 201, Mean WAZ=-1.6, SD=1.3
1994 N= 233, Mean WAZ=-1.3, SD=1.2

Weight for Age and NCP Counseling Cards

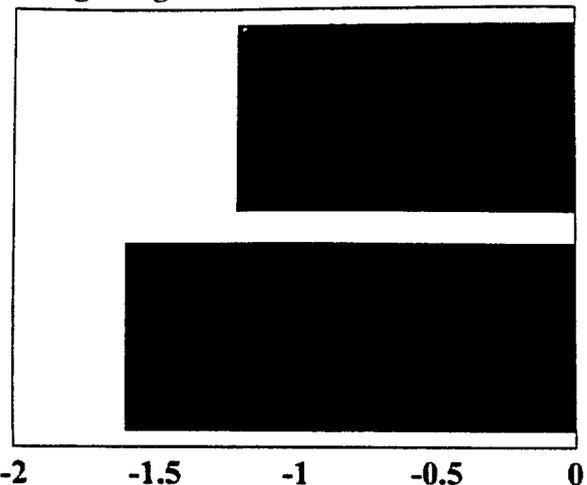
Weight/Age Z Score

Mother remembers card # 10

N=137

Didn't See/remember card

N=436



Mothers of children > 6 months, N= 573 ANOVA p=.007

I. BACKGROUND

A. National Health and Nutrition Priorities

Mali is a landlocked West African country with a population of approximately 9.2 million. Located in the Sahel, 40% of the land is desert and 35% lies in semi arid regions, suitable only for raising livestock. Climatic conditions are a major cause of poverty and poor health. Recurring droughts have regularly decimated herds of cattle and goats and destroyed millet and sorghum crops, the main dietary staples. Ninety percent of the population are subsistence farmers. Average life expectancy is only 45 years. Infant mortality is extremely high at 170 per 1000 live births; maternal mortality is 2000 per 100,000 live births. Seventy percent of infant and childhood deaths are attributed to malaria, measles, tetanus, respiratory diseases, diarrhea, and malnutrition, all preventable diseases.

Per capita caloric intake in 1989 was above 2000 calories, up from 1720 in 1987. According to the 1987 National Demographic and Health Survey, the proportion of children 3-36 months showing signs of acute malnutrition (weight for height) was very high at 11% and chronic malnutrition (height for age) was about 25%. In Bamako, the capital, 15% of birth weights were below normal. Particularly in the north, vitamin A deficiency is a serious problem, with night blindness prevalent among 9.48% of six-to ten-years old.

The Ministry of Health and Social Affairs (MOH) has overall responsibility for health services in the country. Historically the Ministry has focused on direct provision of services. Overall, about 45% of the population lives within 15 km of a health facility, although official estimates are that only 20% of the population is actually served. Each of the 46 administrative *cercles* has a health center with a Chief Medical Officer. The health center provides outpatient and inpatient care, vaccinations, deliveries, and maternal and infant care. Smaller health centers within the *cercle* have a maternity ward and the ability to provide general medicines, first aid, referrals, and vaccinations. In general, the current health care system is characterized by inadequate facilities, lack of supplies, poorly trained and motivated staff, and the inability to meet recurrent health care costs.⁴ Although the government has expressed its commitment to supporting nutrition activities,

TABLE 1: MALI FACT SHEET

Total population (1990)	9.2 million ¹		
% urban	19% ²		
Per capita GNP	\$271 ¹		
Women receiving prenatal care	31.4% ³		
Deliveries in formal health facilities	13.5% ³		
Deliveries by trained attendants	27% ³		
Infant mortality rate (per 1000 live births)	166 ³		
Under 5 rural mortality rate (per 1000 live births)	303 ³		
Maternal mortality rate (per 100,000 live births)	2000 ³		
Prevalence of under-nutrition			
Age	Wt/Age	Ht/Age	Wt/Ht
6-11 mos.	29.8	16.7	11.7
12-23 mos.	40.5	31.0	18.5
24-35 mos.	33.4	33.2	6.9

Sources:

¹ African Development Indicators, UNDP/World Bank

² State of the World's Children, 1994, UNICEF

³ Mali DHS 1992 (data for 1987/88)

⁴ World Bank Development Report, The World Bank, 1986

the Nutrition Service of the MOH (in the Division of Family Health) has only minimal staff and resources.

B. USAID Strategy

In the late 1980s, curative oriented health care policies continued to consume the majority of government health resources despite the government's stated priorities. To strengthen child survival interventions, USAID funded the 8 million dollar Integrated Family Health Services (IFAHS) Project. The project aimed to reinforce the MOH's capacity to plan, coordinate, and manage national and regional programs. The project included immunization, diarrheal disease control, growth monitoring and promotion, and family planning components. USAID emphasized building a sustainable infrastructure of government and non-governmental personnel trained and equipped to improve maternal and child health. USAID's centrally-funded Nutrition Communication Project, managed by the Academy for Educational Development, was incorporated into the USAID/Bamako development agenda, and managed through its Child Survival portfolio.

C. Rationale for NCP Assistance

In late 1988, when NCP made an exploratory visit to Mali, the country was recovering from a devastating drought which had severely affected the nutritional status of the population. The prime nutrition interventions were food-for-work programs and a country-wide system of Nutrition Rehabilitation and Education Centers (CREN) through which the government and donors distributed emergency relief food. A Famine Early Warning System was in place to survey all regions of the country for prevalence of protein-energy malnutrition. At this time, due to pressures by international agencies, the government had decided to reorient its national policies towards preventative nutrition and child survival.

During its first needs assessment visit in October 1988, NCP was asked to develop a strategy document for an initial social marketing effort to improve dietary management of diarrhea, infant feeding, and growth monitoring. National data⁵ at that time indicated that one fourth of Mali's children suffered from moderate to severe malnutrition which contributed to an rural under-five mortality rate of 303/1000 in rural areas. Women's diets were poor during pregnancy and nursing, and children's diets lacked vitamins and minerals (such as vitamin A and iron), as well as the energy required to support adequate growth. In response, NCP worked with the Division of Family Health's Nutrition Service to lay out objectives and design a program that focused on village-level promotion of maternal and child nutrition, supported by health worker and teacher training and appropriate educational materials.

In September 1989, NCP received an initial grant from USAID/Bamako to carry out IEC development activities (Phase I of three eventual phases). To these funds, NCP added vitamin A funding from central resources, Mission operating year budget funds for evaluation, and obtained funds for materials development from the Helen Keller International VITAP Project. Work was

⁵ Demographic Health Survey, 1987.

begun under the aegis of the Nutrition Service, which viewed the activities as a means of testing new approaches and materials that would become part of the government's general program.

Rather than create a free-standing nutrition education program, NCP worked with the Ministry of Health (MOH) and private voluntary organizations (PVOs) to build a nutrition emphasis (and introduce new communication materials and counseling activities) into their related programs—such as different child survival components, safe motherhood, and so forth. The NCP program design placed heavy emphasis upon institutionalizing communication capacities within these PVOs and a central government organization. During the course of the project, the number of governmental agencies involved grew to four, and the number of PVOs grew from an initial three to ten.

The project benefitted from cross-fertilization with NCP programs in Niger and Burkina Faso. Prototype communication materials were shared among the projects and adapted to fit the needs of varying audiences and message emphases. Joint training and eventually sharing of professional expertise through consultancies also contributed to building of capacities in the region.

The six-year project (1989-1995) took place in three phases:

- Phase I: Program Development, 1989-1991;
- Phase II: Expansion, 1991-1993;
- Phase III: Consolidation, 1993-1995.

II. PROGRAM DESIGN

A. Objectives and Scope of NCP Assistance in Mali

From the outset, NCP's primary goal was to assist the Ministry of Health and PVO Child Survival Projects mount communication activities that enabled rural populations to improve the nutritional status of women and young children. This outcome was to be achieved through three specific goals:

- Improve maternal nutrition during pregnancy and lactation;
- Sensitize parents to the importance of nutrition and improve their abilities to feed their children appropriately;
- Promote consumption of foods rich in micronutrients, particularly vitamin A, among pregnant and lactating women and among children six months to three years old.

To achieve real gains in nutritional status among women and children, program designers reasoned that more than knowledge change was required. Individuals and communities would need to make changes in *attitudes and behaviors* related to food and other resource distribution, as well as in food consumption practices. Therefore NCP adopted a three-fold approach:

- Train PVO/Child Survival Project staff in nutrition behavioral assessment, better interpersonal communication and counseling, behavior change monitoring, and evaluation;
- Amplify and support interpersonal nutrition messages through a range of media, including village level stories and plays, literacy and basic educational activities, and mass media;
- Institutionalize the IEC development and implementation process so that nutrition IEC would become a sustainable activity for the MOH and NGOs in Mali.

These overall objectives and approach remained constant from Phase I (Program Development) through Phase II (Expansion) and Phase III (Consolidation).

B. Geographic Area of Intervention

NCP activities were initially carried out in the Ségou region of Mali, approximately 200-300 miles east of the capital, Bamako, where the original three PVOs (CARE, AFRICARE, and World Vision) were active. As the number of PVOs involved in the program grew, the intervention area also expanded. Ségou is linked to Bamako by a well maintained paved road. Macina, the site of the CARE project, is located on the Niger River, three to four hours northeast of Ségou. Although Macina was the most remote and driest of the project sites, the dirt road which connects Macina to Ségou and Bamako is almost impassible in August and September during the rainy season. In other seasons deep ruts make the trip slow and arduous. The AFRICARE site was in Dioro, also along the Niger River, but only an hour beyond Ségou on a well maintained road. The World Vision field headquarters were in Koutiala, an hour and a half southeast of Ségou on a well paved road. Koutiala was the furthest south and on a main artery, had relatively more rainfall than the other sites, and access to more amenities.

In 1991 at the outset of Phase II, the number of PVO partners grew to ten; however the overall geographic area of intervention did not change significantly. Addition of the Save the Children project based in the Sikasso region extended the intervention zone 100 miles to the south. Plan International, (the fifth USAID-funded PVO), and five smaller Malian NGOs which joined the Nutrition Network were clustered in the Ségou-Sikasso region.

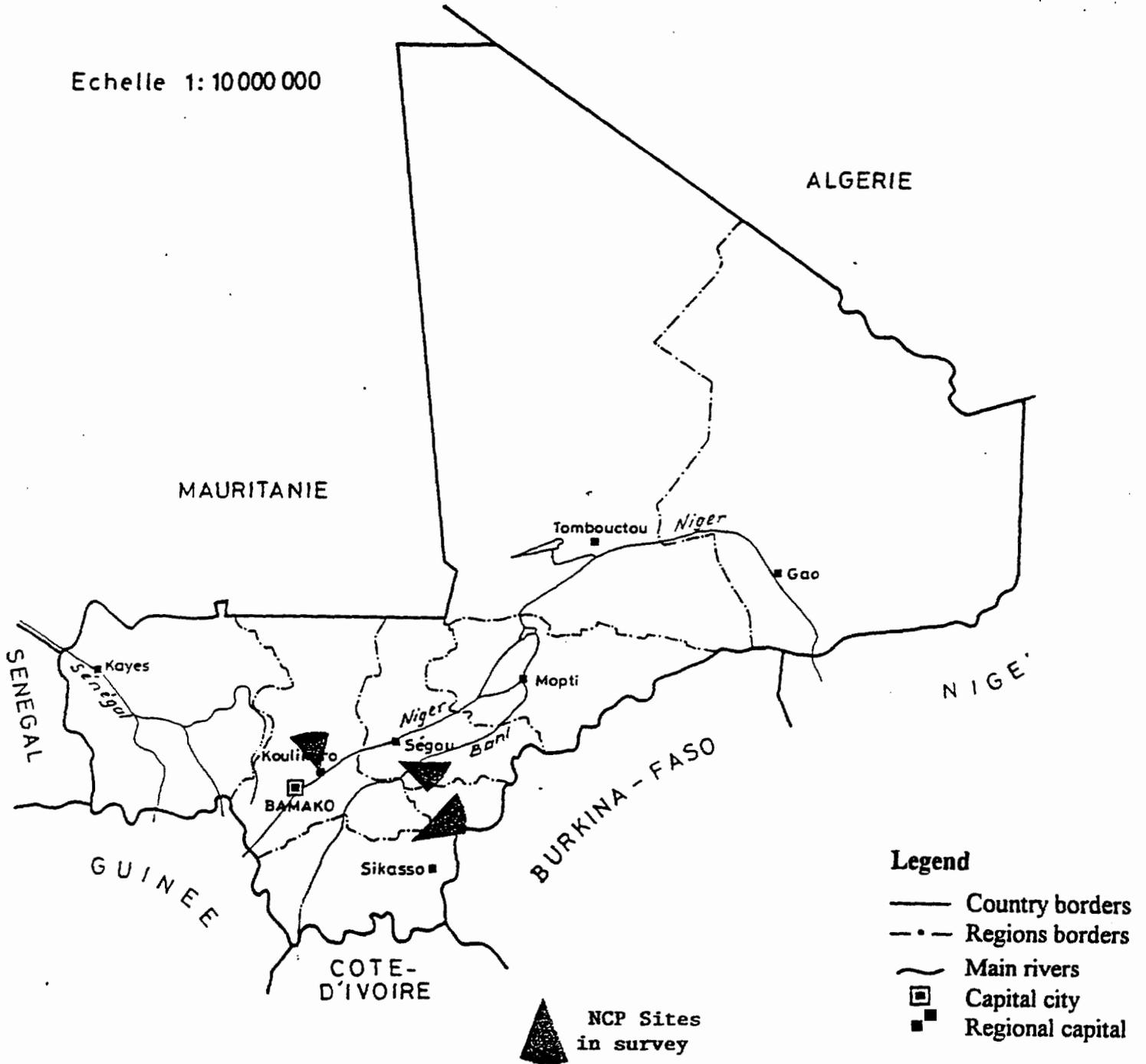
TABLE 2: MALI PROJECT FACT SHEET

Population (in project areas):	760,000		
NCP Partners:	Ministry of Health, National Center for Health Information, Education, and Communication (CNIECS), National Literacy Service, Ministry of Education, UNICEF, FAO		
Collaborating PVOs:	CARE • AFRICARE • World Vision • Save the Children • Plan International • Aide à l'Enfance Canada • Association d'Entre-Aide pour le Développement • Association d'Aide et d'Appui aux Groupements Ruraux et Urbains • Programme Intégré de Développement de Bafoulabé • Centre D'Appui Nutritionnel et Economique aux Femmes		
Project Duration:	Phase I: October 1989 - September 1991 Phase II: October 1991 - April 1993 Phase III: May 1993 - April 1995		
Funding:	<u>Phase I</u>	<u>Phase II</u>	<u>Phase III</u>
• USAID			
Vitamin A Funds:	\$ 55,477	\$ 54,779	
Africa Bureau:	\$ 94,523		
USAID/Bamako:	\$ 70,000	\$250,000	\$350,000
Totals by Phase:	\$220,000	\$304,779	\$350,000
Total all Phases:			\$874,779
• UNICEF			\$220,000
Media Mix:	Community-based Activities, Interpersonal Counseling, Radio, Theater, School-based Nutrition Education		
Key Products:	<ul style="list-style-type: none"> • 650 sets of 5 Flipcharts • 50 Teacher's Guides • 1000 sets of 2 Literacy Books, 250 of Literacy Book #3 • 920 Radio Spots • 20 Radio Drama Episodes (broadcast 2x) • 250 <i>Compagnon Villageois</i> Health Worker Notebooks • 1000 sets of 10 Counseling Cards • 125 Facilitator's Guide for Flipcharts 		
Number of TA Visits:	• Phase I: 10	• Phase II: 13	• Phase III: 5
Number of Training Events:	<ul style="list-style-type: none"> • 6 Skill Building Workshops • 1 Strategy Development Workshop • 3 Planning Workshops • 1 Lessons Learned Workshop • Trained 360 NGO and Field Staff 		
Research:	<ul style="list-style-type: none"> • Formative Research: <ul style="list-style-type: none"> - Rapid Ethnographic Assessment (Dec 1989) - Focus Groups and Market Surveys (Jan - March 1990) • Baseline Survey (Dec 1990): 835 women, 524 men, 657 children • Mid-term Evaluation (Feb 1993): 272 women, 81 men, 211 children • Final Evaluation (Dec 1994): 712 women, 345 men, 845 children 		
Future Directions:	UNICEF is funding the continuation and expansion of activities.		

FIGURE A
Map of Mali

REPUBLIQUE DU MALI

Echelle 1:10000000



C. NCP Partners

1. Government Agencies

During Phase I (Program Development), NCP collaborated with the MOH Nutrition Section which had overall responsibility for the National Vitamin A program in four regions: Gao, Mopti, Ségou and Tombouctou. However, from the start, NCP collaborated in implementing field activities with PVOs already administering Child Survival Projects. The Nutrition Section agreed to act as facilitator and coordinated activities with its regional representative in Ségou and the three initial PVO partners. This arrangement enabled NCP to avoid bureaucratic complications and start field activities quickly by tapping into the momentum of ongoing PVO programs while at the same time building a working relationship with the Nutrition Service.

Around the start of Phase II, the National Center for Health Information, Education, and Communication (CНИЕCS) was created. Due to its special focus and supported by the dynamic leadership of its first director, Dr. Mamadou Kante, CНИЕCS gradually took on responsibility for leading the project. NCP's plan was to create a group of skilled CНИЕCS staff with experience in nutrition problem assessment, educational materials design, and the use of mass media. Another goal was to strengthen CНИЕCS capacity to provide training in interpersonal counseling and group communication skills. CНИЕCS designated two staff and a third-year Peace Corps volunteer to work full time on NCP activities.

Throughout the project, CНИЕCS organized periodic strategic planning meetings for Nutrition Network members. These meetings provided a forum to exchange ideas and program experience, discuss specific training needs and suggest ways for NCP to provide additional field support. The meetings also served to provide feedback from supervision visits, review new ideas and distribute additional sets of materials. All PVOs in the network considered this forum to be a major advantage of the project.

By 1993, CНИЕCS had established itself as the primary source of nutrition training and materials development in Mali. The Center's commitment, increased efficiency, and the high quality of services it delivered to child survival projects were increasingly noticed by MOH personnel. At the first National Health Day Fair, in 1994, the Minister of Health publicly recognized the CНИЕCS for its accomplishments, commenting specifically on the audio-visual materials it had "helped develop and the unique strategy of promoting the use of separate bowls for feeding the younger children in the family."

Two other governmental agencies, the National Literacy Service and the Ministry of Education were also regular partners in mounting the Nutrition Communication Program. The Literacy Service translated the text for three nutrition literacy booklets and representatives from the Ministry of Education were active members on the task force that developed two Teacher's Activity Guides and carried out training workshops designed to integrate the guide into field programs.

2. PVO/NGO Partners

During Phase I, NCP collaborated with three PVO child survival programs, CARE, AFRICARE, and World Vision. Working with ongoing, well-funded PVO programs offered the advantage of a strong field staff supportive of new program ideas and educational materials, as well as a community-level presence. At the end of Phase I, NCP was poised to extend and strengthen its approach to a broader set of partners through the establishment of a Nutrition Communication Network.

During the first months of Phase II, Save the Children and Plan International joined the three original partners. Shortly afterwards, NCP met with staff members of Save the Children, the coordinating agency for all NGOs operating in the health sector, to identify national partners eager to include nutrition education in their activities. The three selection criteria were established; they had to be located in the Bamako - Ségou - Sikasso geographic zone, they had to have ongoing well-organized field activities, and, to maintain a balance in project inputs, they had to cover approximately the same sized population as the PVOs with whom NCP was already working. By early 1992, five Malian NGOs were invited to join the network. These local NGOs were fully integrated into NCP activities three months later during a series of training workshops.

The project also worked with Group Pivote, a partnership of PVOs active in the health arena and encouraged to collaborate together by USAID.

3. International Organizations

In 1991, contacts were also initiated with UNICEF, FAO, World Food Program, and UNFPA to explore possible collaboration. FAO and UNICEF subsequently worked closely with NCP.

FAO

In 1992, the Food and Agricultural Organization of the United Nations (FAO) launched the Sahel Vitamin A Communication Project. The project held three technical workshops in rural radio, print, and video techniques for participants from five countries, including key MOH staff from Mali working with NCP. NCP collaborated with the FAO in implementing the first two workshops, which were held in Burkina Faso.

UNICEF

In early 1993, NCP and UNICEF began working on a joint initiative to introduce modern nutrition education concepts in primary schools. Following an initial period of collaboration, UNICEF agreed to assist financially in the development of Teachers' Activity Guides and the production of two literacy booklets. Collaboration with UNICEF continued to expand through mid-1994. As NCP began to wind down its financial support of field activities, UNICEF provided funding to maintain nutrition communication activities in Mali and expand into new sectors and new geographic regions. NCP Local Coordinator Katerina Sissoko was subsequently hired to work full time with UNICEF/Bamako. The coordination role of CНИЕCS has also been further strengthened.

TABLE 3: PRINCIPLE ACTIVITIES OF PARTICIPATING PVO/NGOS

CARE

The CARE Macina Child Health Project (MCHP) was designed to reduce infant and child morbidity and mortality by targeting the caretakers of children aged 0-5 years. The project built upon work initiated in 1986 through a USAID Child Survival Grant.

Phase II (1990-1993) of MCHP expanded activities to five districts of the Macina circle in the Ségou region, providing preventive primary health care training in more than 80 villages and hamlets serving approximately 56,000 people. Primary health care education training concentrated on immunization, nutrition, diarrheal disease control, prevention of high-risk births, hygiene and sanitation, family planning, and village health committee/worker training. MCHP interventions were complemented by activities in four other CARE projects: the Macina Wells Project, the Development of Arid Zone Agriculture Project, Agro-forestry and Food Security Initiatives, Macina Literacy Initiative, and Macina Environmental Sanitation Support project.

The project strategy was based on two village intervention strategies: "training" and "maintenance." During the first two years of intervention in a particular village, field staff conducted intensive training of the population. Once a village demonstrated satisfactory knowledge of project interventions, they advanced to the maintenance stage. During this stage, emphasis was placed on reinforcing preventative health care practices and supporting a local health management structure (Village Health Committees).

From 1989 on, CARE was intensively involved in both the developmental stages and implementation of NCP. In late 1989, formative research was conducted in MCHP villages. In 1990 three *monitrices* (nurses with high school training) participated in the NCP Strategic Planning Workshop and assisted in the development of the NCP flipcharts. The MCHP project are constituted one of the three KAP baseline sites. In early 1993 a mid-term evaluation was conducted in half of the baseline villages. Full collaboration with NCP continued until the end of Phase II in 1993 when a funding shortfall caused CARE to curtail health activities for 18 months.

CARE sent all 15 field *monitrices* to each of the first three NCP skill-building workshops. CARE's field *monitrices* used the NCP flipchart set, counseling and group animation techniques directly with the village population during weekly visits.

SAVE THE CHILDREN

The Save the Children Child Survival Project was initiated in September 1992 to reduce maternal and child morbidity and mortality through the promotion of protective behaviors and village self-management. Project activities included: immunization, control of diarrheal disease, birth spacing, environmental hygiene, malaria control, nutrition education and growth monitoring, maternal care, and clean water use. Other interventions in the project zone included agriculture, literacy and non-formal education, credit, water and sanitation, and community primary schools.

Save the Children's zones of intervention included the Kolondieba and Zantiebougou districts in the southern region of Sikasso, covering a population of approximately 150,000 in 250 villages. The staff implementing Save the Children's primary health care activities included two doctors, nine nurses, six health supervisors, and approximately 33 village-based health agents. NCP and SAVE collaborated from the outset of Phase II in 1992 through the end of NCP. Two SAVE supervisors and four or five senior health agents participated in all of NCP's training workshops, helped pilot test the *carte familiale*, the non-formal Teacher's Guide, and the radio drama, *Saheli Sama*. The SAVE project area was also one of the final evaluation sites.

After each NCP workshop, SAVE supervisors organized their own in-house training for the remaining village-based agents. Each agent integrated NCP techniques and a complete set of materials into his or her development activities.

AFRICARE

In 1989, AFRICARE initiated child survival activities in 30 villages around Dioro in the Ségou region. The project sought to decrease infant and child mortality by focusing on vaccination, growth monitoring, diarrheal disease control, nutrition education, maternal care, and family planning. Phase II, initiated in 1993, expanded activities to 52 new villages (population 92,500) .

The AFRICARE Project strategy promoted:

- increased use of the Dioro Health Center,
- educational activities through village health teams supervised by three nurses,
- the creation and development of Village Health Committees.

AFRICARE's collaboration with NCP began in June 1990 at the Strategic Planning Workshop and continued through the final evaluation in 1995. AFRICARE villages participated in the NCP's baseline survey and final evaluation. AFRICARE health agents collaborated on the development of the flipcharts and pretested the radio drama. Field supervisors and all eight field agents participated in each of NCP's skill-building workshops. Field agents integrated NCP materials and counseling techniques directly into their village programs.

WORLD VISION

The World Vision Child Survival Project, located in Koutiala district, covered 60 villages and the town of Koutiala (total population 100,000). The project priority interventions included nutrition, oral rehydration therapy, maternal/child care, immunization, malaria control, HIV/AIDS education, and promotion of income generating activities for women. World Vision, one of NCP's three original partners, participated in the Strategic Planning Workshop, the baseline survey, was active in pretesting the radio drama, the Non-Formal Teacher's Guide, and participated in the final evaluation in 1995.

Three World Vision supervisory field staff attended all of NCP's communication skills workshops and helped facilitate three workshops for the national NGOs once they joined the Nutrition Network. In turn, field staff trained up to 600 village volunteer health agents in counseling techniques and the implementation of educational activities. Approximately half of these volunteers received sets of counseling cards.

CENTRE D'APPUI NUTRITIONNEL ET ECONOMIQUE AUX FEMMES (CANEF)

Founded in Mali in 1992, CANEF's primary goal is to reduce hunger and malnutrition among women and children. The project serves a rural population of 127,552 inhabitants in the southern Sikasso region, targeting mothers and children from 0-5. CANEF activities integrate nutrition education into a credit and savings program. The project's goals are to:

- organize local management structures,
- improve access to credit for underprivileged women,
- encourage savings,
- improve family food security,
- improve the health and nutritional status of mothers and children,
- serve as a financial intermediary between local organizations and larger financial institutions.

Principal educational themes are exclusive breastfeeding, infant feeding, birth spacing, vaccination, and diarrheal disease control.

Three CANEF health agents collaborate with village health volunteers who assist in monitoring activities. Starting in 1992, CANEF regularly sent two participants to each of NCP's workshops. Following each workshop health agents carried out orientation sessions for village volunteers and equipped them with counseling cards.

TABLE 3: PRINCIPLE ACTIVITIES OF PARTICIPATING PVO/NGOs (Cont')

AIDE A L'ENFANCE CANADA-MALI (AEC)

AEC has administered development projects targeting women, children, and underprivileged populations in collaboration with national NGOs since 1986. Currently AEC's project activities include promotion of children's rights, community development, institutional support to national NGOs, gardening, formal and informal educational programs, maternal and child health, and youth training.

Beginning in 1993, nutritional activities implemented by AEC in the Koulikoro region included educational sessions, culinary demonstrations, growth monitoring, pre-natal care, and distribution of iron capsules. AEC sent participants to NCP's interpersonal and group communications workshops and the Teacher's Guide training-of-trainers. Upon return to the Koulikoro region, participants integrated the use of NCP flipcharts, counseling cards, and interpersonal communication techniques directly into field activities.

PLAN INTERNATIONAL

The Plan International Child Survival Project located in the Koulikoro region has four components: vaccination, control of diarrheal diseases, malaria control, and nutrition. Nutritional objectives are to decrease malnutrition among children 0-11 months from 28%-20% and among children 12-36 months from 51%-40%. Plan agents are supported in the field by Village Health Committees, midwives, and first-aid assistants.

Activities include:

- malnutrition detection,
- weighing and measuring children,
- distribution of vitamin A capsules to severely malnourished children,
- education using NCP visual supports,
- GRAAP methodology,
- culinary demonstrations.

Plan began using NCP materials and techniques in mid-1992 following the interpersonal communication workshops and continued collaboration until the end of the project. Nutrition messages and materials were transferred from workshop participants to the population through Village Health Committees, midwives, and first-aid assistants.

ASSOCIATION D'ENTRE-AIDE ET POUR LE DÉVELOPPEMENT

A national women's association, Association d'Entre-aide et Pour le Développement has 52 independently run women's cooperatives in three of Mali's eight zones. Primary activities include credit and savings and income generation activities, such as gardening, soap-making, cereal banks, cloth dying, and fence making.

Following the 1992 NCP workshop, AED integrated nutrition education into income generating projects through three cooperatives (interfacing with 30 villages) in the Ségou region. AED sent participants to three skills-building workshops who then used all NCP materials (including flipcharts, counseling cards, and *cartes familiales*) and counseling techniques in their weekly educational activities with women.

PROGRAMME INTÉGRÉ DE DÉVELOPPEMENT DE BAFOULABÉ (PIDEB)

The national PVO, Programme Intégré de Développement de Bafoulabé (PIDEB), receives financial support from Norway and runs agriculture, health, and education programs. Eight PIDEB animators serve 65 villages in the Kayew region. Activities include gardening, water and sanitation, family planning and AIDS education, vaccination, malaria control, and literacy training. Nutrition interventions consist of weighing children, home visits, nutrition education sessions on exclusive breastfeeding and appropriate weaning, interpersonal counseling, and milk distribution.

Starting in 1992, all of PIDEB's field agents participated in each NCP communication skills workshops and according to supervision reports, mastered interpersonal communication techniques particularly well. PIDEB agents incorporated NCP flipcharts, counseling cards, and *carnet familial* directly in their educational program and assisted in pretesting the radio drama, *Saheli Sama*.

ASSOCIATION D'AIDE ET D'APPUI AUX GROUPEMENTS RURAUX ET URBAINS (3AG)

Based in the Koulikoro region, the Association d'Aide et d'Appui aux Groupements Ruraux et Urbains (3AG) covers 17 villages with a total population of 35,000 inhabitants. Principal nutrition activities include:

- weighing and measuring children each quarter,
- culinary demonstrations,
- family education sessions.

One 3AG animator collaborates with midwives to integrate nutrition education into agriculture, water, gardening, wells, and savings programs. This health agent participated in all NCP workshops from 1992 on and volunteered to assist in the piloting of the *carnet familial* , and pretesting the radio drama.

D. NCP Technical Assistance

NCP provided technical assistance through a series of short-term consultancies and, starting in October 1992, through a full-time Local Coordinator.⁶

In September 1992, NCP hired Robin Anthony as a full-time Local Coordinator to monitor and provide support to all on-going project activities and ensure efficient communication among NCP partners and between Mali and Washington. Anthony worked out of the AFRICARE office in Bamako until June 1994 when she left Mali to continue work with NCP in Washington. Katerina Sissoko, a permanent resident of Bamako, took over Anthony's responsibilities at that time. In early 1995 after the project ended, Sissoko began working full-time with UNICEF as coordinator of nutrition communication activities with CNIECS.

E. Project Phases and Activities

1. Phase I: Program Development, 1989 - 1991

The object of the 24-month Phase I was to develop an initial communication program in collaboration with the MOH and private voluntary organizations. NCP received an initial grant of \$50,000 from the USAID Mission in Mali. Additional funding included 150,000 from USAID/Washington and \$20,000 from Mission operating year budget (OYB) funds.

Major activities carried out during Phase I included conducting qualitative research, organizing a Strategy Development Workshop to analyze research results and initiate message design, developing a village-based counseling approach, and preparing a first round of educational materials. The Nutrition Service saw Phase I as a means of pilot-testing new approaches and materials that would become part of the government's regular program, once their value was established in community settings.

Two turning points for the project came at the end of 1990 and the beginning of 1991.

⁶In December 1989, Dr. Katherine Dettwyler, nutritional anthropologist, worked with CARE *monitrices* in Macina to conduct a rapid ethnographic assessment of factors affecting vitamin A nutrition and traditional beliefs about night-blindness. Dettwyler returned to Mali in early 1990 and, together with NCP Deputy Director Dr. Claudia Fishman, co-directed in-depth formative research. Local consultant Dandara Kanté provided additional technical assistance during the qualitative research and participated in every subsequent research and evaluation activity carried out by NCP. Kanté, a nutritionist trained in the United States, also played an active role in the development of the two Teacher's Activity Guides and the organization and implementation of each training workshop series. In 1994 Kanté continued collaborating with NCP in her new capacity as full-time IEC coordinator for the USAID-funded Pivot Group (a group of PVOs focusing on health). Regional Consultant Peter Gottert initially provided technical assistance to NCP during the 1990 Strategy Development Workshop and oversaw the early development of print materials. In February 1991 Gottert became the NCP Program Officer responsible for the Mali project. Consultants Dr. Phillip Burnham (an American journalist) and Dr. Antoine Kakou (from the University of Abidjan) helped launch the process of script writing for radio drama and spots. In July 1994, Colin Fraser (a radio communications expert) conducted a five-day workshop to assist the Mali team to revise the radio drama, *Sahel Sama* after its initial broadcast. Emory University was contracted to conduct the final evaluation. Dr. Anne Golaz from the U.S. Centers for Disease Control and Prevention led the evaluation field work.

- The NCP 1990 *KAP and Nutritional Status Survey* (conducted at PVO project sites), revealed that acute malnutrition was 3 percentage points higher, and chronic malnutrition was approximately 15 percentage points higher, than the national average. USAID/Mali challenged the NCP/MOH/PVO consortium to reduce the rate of malnutrition in the regions where they were active.
- NCP was favorably evaluated by USAID in Mali with the recommendation that NCP focus on developing institutions that would promote up-to-date nutrition communication concepts and principles, and provide on-going nutrition training at the local level.

2. Phase II: Expansion, 1991 - 1993

In October 1991, NCP was awarded \$250,000 from USAID/Mali to scale up activities and implement a comprehensive communication and training program for PVO child survival projects. The overall goal of Phase II was to train and equip an expanded number of PVO/MOH Child Survival Project teams to mount nutrition communication activities designed to measurably improve the nutritional status of women and young children. NCP's objective was to build on initial investments by assisting PVO and local partners to implement a full-scale nutrition promotion program. The focus of NCP's involvement was on motivating families and communities to make small but critical behavioral changes. To accomplish this NCP encouraged the direct involvement of men in their wife's and children's nutritional health.

Specifically, mission funding was employed to:

- Train and equip local organizations to perform nutrition communications research, materials development and training;
- evaluate the behavior change impact of the program;
- Produce educational, training and mass media materials; and
- Launch a series of workshops to set nutrition IEC on course to become a sustainable activity for the MOH and NGOs in Mali.

During Phase II the NCP Nutrition Network grew from the MOH and three PVOs to include three government ministries, ten local and international health programs, and several key donors, particularly UNICEF. A mid-term evaluation conducted by NCP in January 1993 documented a dramatic improvement in the nutritional status and nutrition-related behaviors of the program's primary beneficiaries.

The request to the Mission for a funding extension in September 1991 was not granted until June 1993. Due to the lag time before approval, NCP executed minimal program activities for a six-month period (January-June 1993). During that interval, Office of Nutrition core funds and Africa Bureau buy-in funds were used to support a reduced level of field activities. Despite postponing some of the more cash-intensive programs, (such as production of print materials), NCP continued developing and recording the radio drama, pretesting images for the counseling cards, and pursuing a joint initiative with UNICEF on nutrition education in primary schools.

TABLE 4: TIME LINE OF MAJOR ACTIVITIES BY PHASE

Activity	Phase I			Phase II		Phase III	
	1989	1990	1991	1992	1993	1994	1995
Formative Research							
Qualitative research	■	■					
Strategy Design							
Review of research/ Message development		■	■	■	■		■
Educational Materials							
Development & pretesting		■	■	■	■	■	
Production			■	■	■	■	
Training							
Training program design		■		■	■		■
Training of trainers		■			■	■	■
Mass Media							
Development of radio					■	■	■
Production of radio spots					■		

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TABLE 4: TIME LINE OF MAJOR ACTIVITIES BY PHASE (con't)

Activity	Phase I			Phase II		Phase III	
	1989	1990	1991	1992	1993	1994	1995
Implementation							
Materials distribution		■		■	■	■	
Field activities		■	■	■	■	■	■
Monitoring visits				■		■	■
Radio broadcasts					■	■	■
Evaluation							
Baseline survey			■				
Midterm survey					■		
Final survey							■
Lessons learned workshop							■

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3. Phase III: Consolidation, 1993 - 1995

In May 1993, USAID/Bamako provided \$350,000 to continue nutrition communication activities through March 1995. Phase III focused on introducing the mass media and primary school and literacy channels and further strengthening the ability of CНИЕCS and the PVO partners to carry out nutrition education at the community level. Phase III activities were characterized by the maturation of the Nutrition Network, which held a series of regular project planning meetings, and by the gradual transfer of greater responsibility for project implementation to CНИЕCS. Throughout Phase III, NCP and UNICEF continued to expand their partnership. By January 1995, following the final KAP and nationwide status surveys, UNICEF had taken over the lead in supporting ongoing activities and introducing proven interventions into new areas of the country.

III. DEVELOPMENT OF THE IEC STRATEGY

A. Audience Research

In order to examine the behavioral correlates of malnutrition in rural communities and develop culturally appropriate nutrition messages and materials, NCP conducted formative research in two phases. CARE was chosen to coordinate the research due to the location of its child survival project site and its administrative capabilities.

1. Qualitative Research

Qualitative research was carried out in two phases. In December 1989, nutrition anthropologist Katherine Dettwyler worked with CARE *monitrices* to conduct a week-long preliminary study of household practices and market factors affecting vitamin A consumption and beliefs about night blindness and infant feeding.

Results from this rapid assessment were used to design questionnaires for in-depth qualitative research, carried out in March 1990. The research design called for 16 focus group interviews and two market surveys. NCP first conducted a two-day orientation for a team on the research methods. In-depth interviews collected information on dietary practices of pregnant women, child feeding practices, seasonal availability and cost of vitamin A-rich foods, and men's participation in the dietary practices of pregnant women and children. The research also looked at appropriate communication channels and media for the rural population. The market surveys identified common vitamin A-rich foods in Macina, the quantities purchased, and their prices.

2. Quantitative Research

The baseline Knowledge, Attitudes, and Practices (KAP) survey was carried out in three PVO sites (47 villages) in December of 1990. (Described in detail below under "Evaluation.") The

project interviewed 835 women and 524 men and collected anthropometric indicators of 657 children's nutritional status. When the results of this research became available, they were also incorporated into a refined communications plan.

3. Summary of Findings

Key findings of the qualitative research were that:

- Mothers delayed feeding most solid foods until children were nearly a year old, and knew of few measures to help sick children regain their strength following bouts of diarrhea and illness;
- Neither men nor women were very aware of women's or children's dietary needs; however, the "right" to good food was thought to be the prerogative of adults who had earned it;
- In villages where a child survival project had been active, the villagers were more aware of the relationship between "good food and good health," and more inclined to believe in their own abilities to prevent illness. In villages that had never participated in a child survival project, the villagers generally felt they had almost no control over their own health;
- "Night blindness" (the first clinical sign of vitamin A deficiency) was a widely recognized condition thought to occur normally in pregnancy. Villagers knew of several traditional remedies (including use, though not necessarily consumption, of animal liver).

The KAP survey found that malnutrition was pervasive among children under three. Only one in three newborns received breastmilk as a first food, and on average, complementary feeding was delayed until nine to ten months of age. Few children were supervised by adults while they ate. Regarding communication channels, 80 percent of women said that health workers were their primary source of nutrition information; more than half the men said they received health information via radio.

The results of the research suggested that the population would be receptive to a number of behavioral changes, including:

Increasing consumption of target foods, specifically: preparing pureed vegetables for children, purchasing liver for pregnant women and young children on market days; drinking milk when pregnant;

- Motivating older women (who do the gardening) to increase the proportion of vitamin A-rich vegetables they grow;
- In general, practicing a preventive approach to malnutrition and night blindness.

B. Strategy Development

Strategic planning took place in two phases: after review of the qualitative research, and again after review of the results from the KAP survey. In June 1990, NCP organized a five-day Strategy Development Workshop which brought together 21 headquarters and field-based PVO and MOH staff to think through the results of the qualitative research and develop a communications strategy. In plenary and small group sessions, workshop participants discussed results, brain stormed, and role-played situations linked to key research findings. Role-playing allowed participants to draw upon their first-hand knowledge of village conditions and breathe life back into the research findings to better understand how proposed behavior changes could be negotiated within given social relationships and contexts. Role-playing proved an effective means of including all workshop participants fully in the strategy development process.

Working from both an analytical and creative interpretation of the research results, participants identified actions that would significantly improve the status of maternal and child nutrition. They also determined priority message concepts, communication activities, and target audiences.

Collaboration with the PVO network helped shape two important aspects of the communication strategy. First, because the PVOs had ongoing programs, the strategy was developed in view of integrating nutrition with other health interventions such as immunization, control of diarrheal disease, and community sanitation. Second, the strategy sought to build upon the foundation of trust and an environment favorable to change that the PVO programs had already created.

In January 1991, at the outset of Phase II, NCP organized two workshops to brief Nutrition Network members and the CNIECS on the results of the baseline KAP survey and involve them in project planning. One workshop was held in Bamako for central-level staff, and one in Ségou for regional field personnel. (Field reports were also presented during these workshops. In addition to individual counseling and village group animation, PVO health workers were reported to have adopted a number of experimental approaches to nutrition communication. For example, CARE conducted "mass detection days" using the upper arm circumference tape and child-to-child communication. World Vision used women's theater and promoted teacher-child-parent communication. AFRICARE had incorporated nutrition education into the gardening component of its project.)

Quantitative data on the prevalence of certain nutrition-related behaviors and the seriousness of malnutrition in the area led to a reassessment of priorities, and of what could be achieved during the project time table. Discussion of the KAP results led to the important decision by the PVO partners to focus communication efforts for at least a year on a reduced set of behavior change objectives:

- Promoting "vitamin A-rich foods" as the prevention and cure for night blindness;
- Emphasizing men's responsibilities for women's and children's nutrition;
- Helping men and women make better food choices in the market place; and

- Promoting discrete child feeding behaviors (e.g. at least three supervised meals/day and use of a separate feeding bowl for children 6 to 24 months old).

C. Target Audiences and Relevant Research Findings

Two key audiences were selected for the communication strategy:

- Pregnant and nursing women, and women who are caretakers of young children.
- Husbands and fathers, the household decision makers.

Pregnant and Nursing Women, and Female Caretakers

Mothers and other female caretakers have the most immediate contact with infants and children regarding feeding practices, and also prepare the food they eat. They are clearly an important primary audience for messages. On the other hand, responses from women in the qualitative research indicated that their decision-making regarding nutrition and other health-related practices is heavily influenced by others. Typical remarks included:

"The chief didn't tell us to go; " or,
"My husband didn't say that I should;" or
"No one told us to do it."

These women have little control over their lives, and have to ask permission or be told to do something, especially with regard to anything new. Women often do not feel free to make decisions on their own, either regarding their own lives, or those of their children. They also feel there is little they can do to improve their lives. In some villages with health posts or active development programs, women who knew the field workers (or *monitrices*) were convinced that they could unite and make decisions themselves that would lead to positive results.

Table 5 summarizes the relevant research findings and hypotheses that relate to pregnant and nursing women.

TABLE 5: PREGNANT AND NURSING WOMEN: RELEVANT RESEARCH FINDINGS AND HYPOTHESES

Women's economic roles In general, women do not cultivate the fields. They gather and sell firewood, or make and sell baskets, or buy food in quantity and resell it to raise the money they need for condiments.

Special needs of pregnant women In contrast to the men's near unanimous agreement that pregnant women need and deserve special treatment, women said that for the most part they did not get any special food, treatment, or consideration when they were pregnant.

For themselves, pregnant women buy grilled meat and grilled chicken in the market, which they consume on the spot, as there is not enough to go around at home. This practice has a positive effect on the nutrition of both pregnant woman and child. (Snacking, therefore, was given legitimacy and encouraged in the communication strategy.)

Can a wife ask her husband for more or better food during pregnancy? In marked contrast to men, most women say they could not ask their husbands to buy them any special food when they were pregnant, either because pregnant women eat just like everyone else, or because this area is not a man's responsibility.

Diet during pregnancy Apparently, there are not any foods which pregnant women are not supposed to eat. By the same token, however, women do not say that there are any foods which are especially good for pregnant women.

Children's diets Women say that children start on breast milk, then eat porridge beginning in the first year, and can eat the family food by 12-18 months.

At the market, women buy oranges, mangoes, papayas, and fried bean cakes for the children—things considered to be "snacks or treats." This practice was also encouraged in the communication strategy.

Supervision of children's meals Contrary to the popular perception that children always eat with their mothers, the KAP revealed that only one-fifth of children eat the majority of meals with their mothers. Nearly half of children either eat by themselves or with other children.

Husbands and fathers, household decision makers

Husbands and fathers were an important target audience for a variety of reasons.

- Women's economic resources are linked to those of men. So it may serve little purpose to pregnant women to inform them about their increased nutritional needs (or those of their children) if their husbands are not willing to provide extra food or money. Thus, it is essential to speak directly to men on behalf of women.
- Men's support will also be crucial to purchasing food for children, and in making sure that the younger children receive more of the meat, fish, and other nutritious foods available to the family as a whole.
- Husbands and fathers (and other people influential in the community) are also key to changes in broader cultural beliefs and attitudes. For example, many Malian parents feel strongly that infants do not need to eat anything special until they are old enough to reach out and take it themselves. This belief, together with other associated ideas about children's diets, must be addressed before recommendations concerning improved weaning foods or feeding young children from a separate bowl, for example, will begin to make much sense to parents. And in these matters, the opinion of men, as arbiters of local belief and custom, carries considerable weight.
- Finally, men have greater access to broadcast media, particularly radio.

Table 6 presents the relevant research findings that relate to husbands and fathers.

TABLE 6: HUSBANDS AND FATHERS: RELEVANT RESEARCH FINDINGS AND HYPOTHESES

Men's economic roles	In most villages, a man's principal responsibility to the household economy is to provide the staple cereal grain(s): millet, rice, corn, etc. He should also pay for clothing, medicine, soap, and taxes. The wife should provide other things— mainly the sauce ingredients.
Special needs of pregnant women	Most men agree that pregnant women have special needs and deserve special treatment. But this special treatment generally means that a pregnant woman should not do heavy labor, carry heavy loads, or walk long distances. For the most part, special treatment does not extend to food.
Pregnancy	Men recognize that pregnant women suffer from a number of symptoms, including stomachaches, headaches, nausea, vomiting, tiredness, swollen feet, and night blindness. Most men view these symptoms as normal aspects of pregnancy, and not as conditions which can be prevented or eased.
Children	Men's food purchases for children appear to be limited to market place snacks, and the choice of food is directed by the children. The most common snacks are: fruits (oranges, papayas, tamarinds, bananas), tomatoes, manioc, fried millet, manioc or black-eyed pea flour cakes (<i>froufrou</i>), fried potatoes, and macaroni. Men sometimes buy meat, fish, or peanuts if the children ask for it.
What must be done for malnutrition?	If a child is sick with malnutrition, men generally say that you must take him or her to the medical center first, or go see a traditional healer.

Additional research findings that facilitated the development of message concepts are presented in Table 7.

TABLE 7: ADDITIONAL RESEARCH FINDINGS RELEVANT TO MESSAGE CONCEPT DEVELOPMENT

<i>Dumuni duman</i>	After satisfying their hunger, people appreciate <i>dumuni duman</i> ("good food"), such as meat, primarily for its good taste, and the pleasure it brings, which they feel are wasted on young children. <i>Dumuni duman</i> is culturally relegated to the men, elders, and others perceived to have "earned the right to eat it."
"Adult food"	Children are prevented from eating "adult food" (primarily millet and rice) too soon as this is thought to make them sick. Once they are weaned from the breast, children are perceived as needing less food than adults, but otherwise not to have any particular dietary requirements.
Children's needs	Rural Malian families see children's nutritional needs and rights as far <i>inferior</i> to adults.
Children's feeding messages	<p>These points suggested a communications strategy to build awareness of children's dietary needs gradually, through the following concepts:</p> <ul style="list-style-type: none">● Parents need to understand that <i>dumuni duman</i> (good food) and <i>dumuni nafama</i> (healthy food) are not necessarily the same thing.● Children actually need "healthy food", (greens and vegetables), in greater proportion to their size than adults.● Children may be given "healthy food" (fruits and vegetables) leaving high prestige "good food" (meat) to adults. Some of the "healthy foods" that are not particularly esteemed include milk, fruits, and vegetables, which can be positioned as foods particularly suited to children or pregnant women in general, or as "preventative" foods.● Because medical cures (which include foods such as animal liver) and "good food" are both considered to be expensive, these more highly esteemed and less available foods could be positioned as "curative" foods for malnutrition and related illness.
Separate bowl message	Younger children traditionally eat from a communal dish with the older children. Using a separate bowl would encourage mothers and other caretakers to give special attention to the dietary needs of children under three years of age. The bowl makes it easier to keep track of the amount of food the child actually consumes and promotes more active feeding behavior.

D. Priority Behaviors and Messages

1. Target Behaviors

A core set of target behaviors which promised to significantly improve the nutrition and health of women and children in rural communities were identified.

For women, to benefit women

- Recognize night blindness as a symptom of nutritional (Vitamin A) deficiency. Learn to choose and eat foods (orange and dark green leafy vegetables, fish, liver, milk) that will prevent and cure this condition.
- Eat extra fruits, milk, peanuts when pregnant.

For women, to benefit children

- Breastfeed exclusively for the first six months.
- Use a separate bowl (calabash) to feed children 6-18 months old.
- Feed at least three meals a day. Supervise meals of children able to feed themselves.
- Give mashed fruits and enriched porridge to children after sickness and during important growth periods.

Taken together, these changes in feeding patterns involved several family members. Although men may not be directly involved in feeding or food preparation, they play a key role, as provisioners of the household, in channeling resources to women and children. They may also actively support (or inhibit) nutrition and health behavior of women and other caretakers of children.

In general terms, the communication objective for men was to enlist their active support in creating a social environment for nutrition behavior change.

Specific target behaviors for men

- Provide pregnant and nursing women with additional resources (cash or millet) to obtain healthy foods.
- Choose 'healthy' foods in the market, when purchasing snacks for children.

2. Messages

Target behaviors were further refined into discrete messages for the target audiences.

Regarding pregnancy

- 1 Pregnant or breastfeeding women: Eat one fresh seasonal fruit daily fresh mango, half a papaya, or another fruit.
- 2 Pregnant women: Eat regularly small amounts of dark green leafy vegetables, fruits, peanuts, and beans.
- 3 Pregnant or breastfeeding women: Improve the quality of your diet by regularly eating more *tôh* and sauce, and also:

Drinking a cup of milk every day if possible,
Eating peanuts often.

- 4 Pregnant women: Eat a kabob with three little pieces of liver every week.

Regarding breastfeeding

- 1 Mothers: Breastfeed your baby as soon as he or she is born.
- 2 Mothers: Feed your baby only maternal milk during six months.
- 3 Parents: A child should be fed milk at least until he or she reaches two years of age.

Regarding the six-month old

- 1 Mothers: Once your baby reaches six months, feed him or her puree made of millet or niebe flour strengthened with crushed peanuts.
- 2 Mothers: Feed your baby of six months at least four times a day. Give snacks in between meals.

Regarding the eight-month old

- 1 Mothers: When your baby is around eight months old, start feeding him or her food that you prepare for the rest of the family.
- 2 Mothers: Make sauces with green leaves often.
- 3 Mothers: Keep an eye on young children while they eat. Make sure a child finishes the bowl and give more if the child is still hungry.

- 4 Mothers: When your child is hungry, give *tôh* or rice; make sure that he or she gets at least half the bowl full of sauce with vegetables, fish, or meat.

Regarding the sick child

- 1 Mothers: Be patient and keep trying to give food to a sick child.
- 2 Mothers: Instead of offering regular food to a sick or recovering child, try to get him or her to eat by giving enriched puree, fish soup, mashed bananas, or a sweet ready fruit.

When a child has diarrhea

- 1 Mothers: Children with diarrhea must drink lots of liquids.
- 2 Mothers: If the child is breastfed and has diarrhea, you must breastfeed him or her more often.
- 3 Mothers: Rice with minced carrots, enriched puree, and mashed bananas are very good for children suffering from diarrhea.

General advice

- 1 Parents: Use an arm bracelet to check if your children are growing correctly.
- 2 Parents: Talk to each other about the needs of your family. Many health related problems have very simple and easy solutions.
- 3 Fathers: Make your children happy by buying them treats such as grilled liver, mangoes, or carrots. It's good for their health.

E. Communication Channels and Outreach Strategies

To provide overall strength and reach to the strategy the program relied upon a mix of three primary communication channels— interpersonal counseling, community mobilization, and radio (drama and spots); and two secondary channels—child-to-child activities and a post-literacy program.

1. Community Mobilization

NCP's communication activities were designed to build upon the activities already being conducted by its partner organization. The PVO child survival partners were all intensively

involved with community mobilization activities. To build on this, NCP developed materials and provided training to strengthen the skills of field agents to identify community nutrition problems, choose appropriate kinds of communication, and use group activities to motivate and share information with communities.

2. Interpersonal Counseling and Supportive Materials

Numerous studies have documented the communicative power of the community health worker in rural areas. NCP hypothesized that a strong bond of trust and confidence would be especially important when communicating information related to eating and feeding habits, because food consumption is controlled by such an extensive set of social rules. NCP aimed to foster an environment in which community workers would encourage parents to put a new health action into practice by listening closely to a parent's concerns, using teaching aids that foster participation, and providing regular follow up.

Print materials to encourage and facilitate communication of specific messages, especially to mothers, were an important part of the interpersonal strategy. Materials were designed for a low- or non-literate user and client.

3. Training

The project put heavy emphasis on training, both because of its goal of institutionalizing communication capacities in ongoing PVO Child Survival Projects, and because of its focus on counseling as a primary channel for communicating messages at the village level. Training was the primary vehicle through which NCP extended nutrition communication activities to new groups and into new geographic areas. The project's training component was designed to provide PVO field workers with the knowledge, skills, and educational materials necessary to elaborate and carry out a community action plan that included individual counseling sessions during home visits and group activities. On the regional level, five series of skills-building workshops were conducted. Each series consisted of three separate activities, a Training of Trainers workshop, and two five-day training programs for PVO and MOH staff.

To promote high quality interpersonal communication between community health agents and parents, NCP developed a five-step approach for nutrition-related assessment and counseling and developed a series of ten cards which focused health workers' attention on communicating priority messages. A part of each training workshop was devoted to strengthening counseling skills.

4. Radio

Radio was included for three reasons: to extend the reach of the overall program; to increase the frequency in which the population was exposed to the nutrition messages; and to reinforce the impact of counseling and community mobilization activities by adding credibility to messages.

5. Literacy Programs

Two NCP partners, CARE and Save the Children conducted active adult literacy components within their child survival projects and signaled the extremely limited range of materials available for newly literate adults. CARE was also exploring ways of teaching literacy through their Child-to-Child Program. In addition, during initial contacts with prospective collaborating government agencies, the National Literacy Service expressed an interest in incorporating nutrition-oriented materials into their program. NCP recognized an opportunity to respond to this demand by developing a series of low-cost booklets in Bambara based on materials the project planned to produce.

6. Primary School and Non-Formal Education Programs

NCP began to look at practical ways to introduce nutrition lessons into schools, both in response to a need expressed by the PVO partners, and in order to build sustainability into the communication program. During Phase I, CARE successfully launched its Child-to-Child program, and expressed a need for nutrition lessons that could be incorporated into a non-formal educational setting at the village level. UNICEF also operated a non formal adult education program in several regions of the country. In addition, during initial contacts with the Ministry of Education, officials indicated their desire to update the health and nutrition curriculum with information and materials relevant to Malian families.

IV. TRAINING AND MATERIALS/MEDIA PRODUCTION

A. Materials/Media Development

Qualitative research carried out by NCP in both Burkina Faso and Mali confirmed that basic nutritional problems in the two countries were similar. Consequently, project teams in the two countries agreed to collaborate on the development of an initial set of materials, five nutritional flipcharts and a facilitator's guide. NCP also produced a series of ten counseling cards, three literacy books in Bambara, Teachers' Activity Guides for formal and non-formal situations, and introduced an experimental material originally developed in Burkina FASO, the *carnet familial*.

1. Flipcharts

Portable flipcharts or "village storybooks" were selected as the principle print material because a believable, culturally appropriate story line has been an effective vehicle to communicate messages in this society. The flipchart format allows the audience to observe and identify with characters who make decisions within the same context and financial constraints as themselves. As the characters in the story begin to put recommended actions into practice, the health benefits to their families are quickly apparent. The flipcharts were designed to encourage the audience to viciously work through resistance points and then (also indirectly) experience the benefits of a new

nutrition behavior. By linking recommendations with explanation of fictional illustrations is important and how recommended nutritional practices can be carried out, flipcharts helped bridge the gap between knowledge and behavior change. The flipcharts were designed for use by PVO community health agents, as part of their ongoing health education program, and in and other settings, such as schools.

An initial 500 flipcharts were printed in New York with the remaining 2,750 printed in Burkina Faso.

Table 8 summarizes the story and principal messages of each flipchart.

Title	Theme	Development
1. <i>"L'alimentation d'Awa"</i>	Causes of vitamin A deficiency	Flipcharts #1 & #2 (the "Awa" series) were first developed in Burkina Faso by the HKI VITAP project in collaboration with World Relief and Cathwel. NCP's participation began during the pretest stage. Following 12 months of field use, an evaluation was conducted on the first edition, which was modified and reprinted.
2. <i>"Awa découvre la solution"</i>	Preventing vitamin A deficiency	
3. <i>"Pourquoi Sita est vigoureuse et en bonne santé?"</i>	Feeding children during and after episodes of diarrhea	Flipchart #3 was initially developed in Mali and then pretested in both Mali and Burkina Faso.
4. <i>"Pourquoi le bébé de Mariam est en bonne santé?"</i>	Maternal nutrition, prenatal care	Flipcharts #4 & #5 were developed from the slide presentation <i>Deux Familles Burkinabè</i> .
5. <i>"Les enfants de Fati retrouvent la santé"</i>	Maternal nutrition, recuperative feeding of young children, and growth promotion	

FIGURE B
Flipcharts



- Intended Use:** Aid health personnel and community development workers in communicating key messages during group health and nutrition sessions
- Production Data:** 650 sets of 5 flipcharts
- Purchases:** UNICEF purchased 100 sets of the five flipcharts.
- Audience:** Community development agents, primary school teachers and teachers in non-formal education programs.
- Language:** French. At the end of the project UNICEF had the flipcharts translated into Sonraj, Peulh, Tamacheq and Bamanan.

FIGURE C
Le Compagnon Villageois



Village _____		Date _____	
Nom de l'enfant _____			
Problème prioritaire	_____		

Plan d'action	1.	_____	

	2.	_____	

	3.	_____	

Autres signes	1.	_____	
	2.	_____	
Prochaine visite _____ à _____ H _____			

Intended Use: Aid community development agents to carry out the 5 step counseling approach

Production Data: 250 copies

Audience: Community development agents

Language: French

FIGURE D
Counseling Cards



Intended Use: Aid health personnel and community development workers in communicating priority messages during individual and nutrition sessions

Production Data: 1000 sets of ten cards

Audience: Community development agents, primary school teachers and teachers in non-formal education programs.

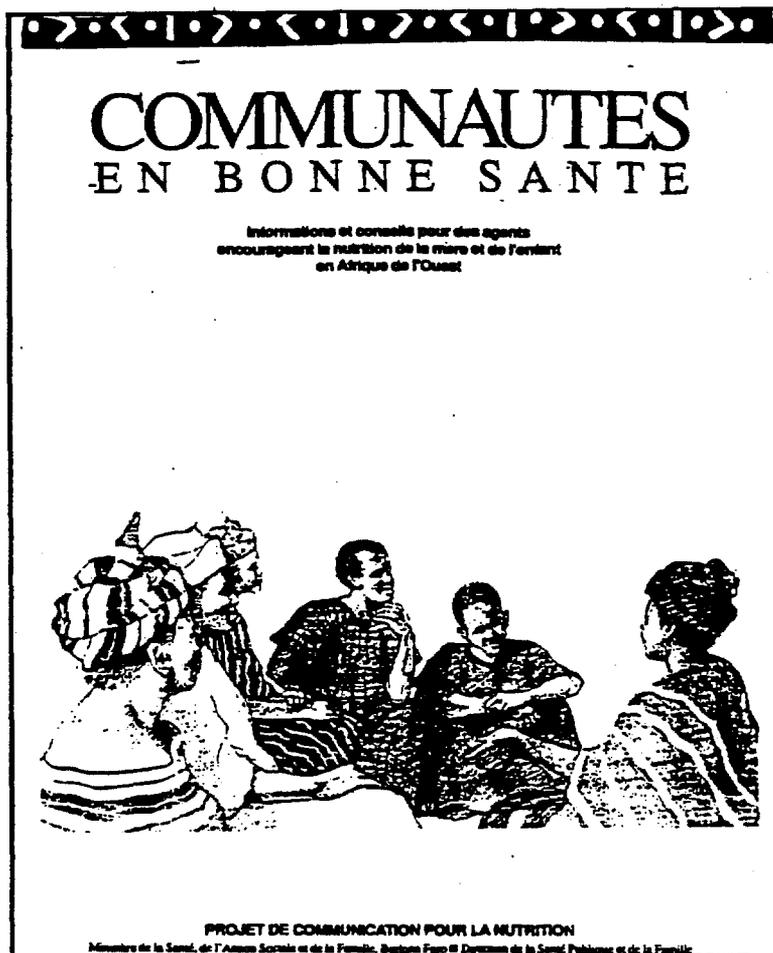
Language: French.

FIGURE E
Facilitator's Guide for Flipcharts



- Intended Use:** Help community development agents to make creative use of the 5 flipcharts by summarizing the main messages and suggesting creative ways to use them
- Production Data:** 125 copies
- Audience:** Community-level development workers
- Languages:** French

FIGURE F
Health Worker Counseling Manuals



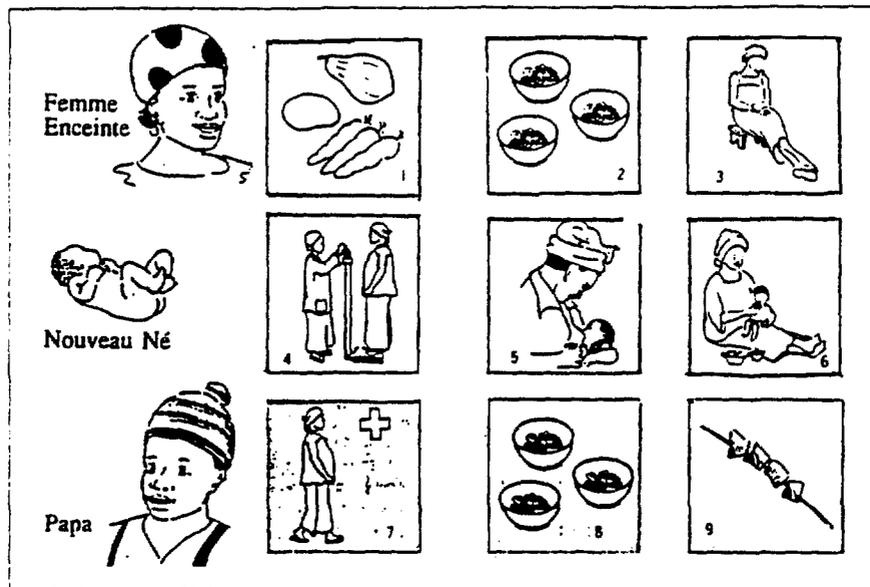
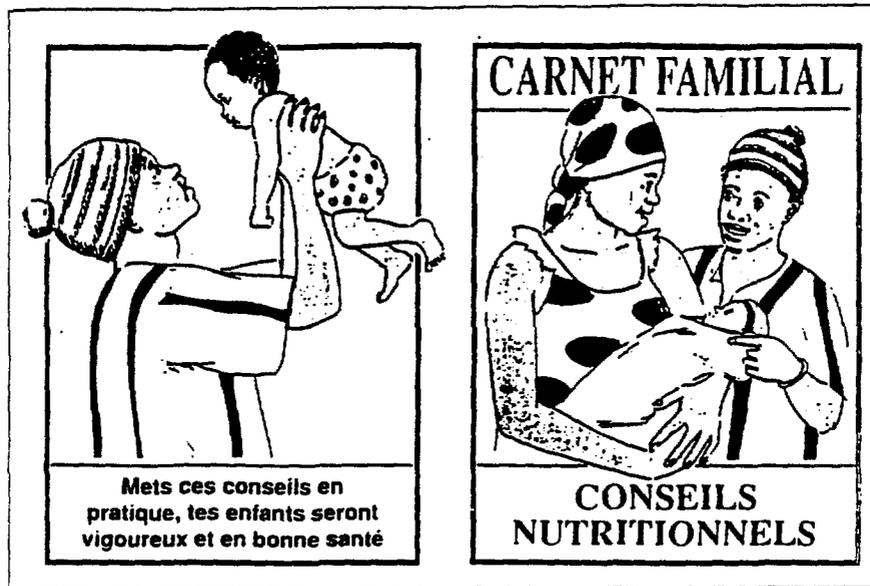
Intended Use: Guide health workers: Volume I provided basic nutrition information. Volume II presented NCP's 5-step counseling approach on maternal, infant and child nutrition; the counseling approach teaches health agents to identify priority problems, set up an action plan with the mother and provide follow up.

Production Data: Copies produced: 1,000

Audience: Health workers

Languages: French

FIGURE G
Carnet Familial



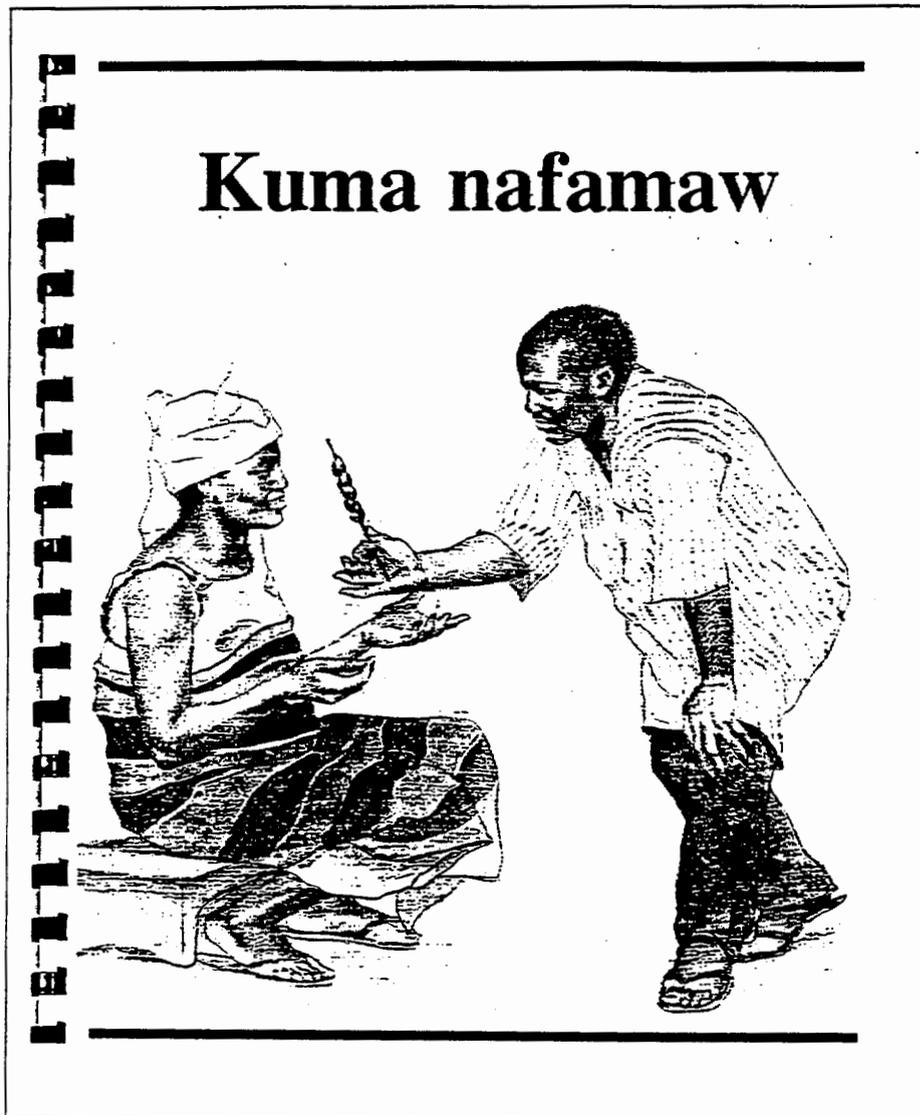
Intended Use: Tool for community development agents to use in counseling mothers by recommending specific health and nutrition-related actions the mother should take.

Production Data: Copies: 5,000

Audience: Mothers, fathers, other caretakers

Language: French

FIGURE H
Literacy Booklets



Intended Use: Material for use in PVO and government-organized literacy programs to communicate health and nutrition messages.

Production Data: 1,000 sets of 2 booklets, 250 copies of booklet #3

Audience: Adults learning to read

Language: Bambara

2. Counseling Cards

During supervision visits following the December 1990 training workshops, PVO field agents suggested developing a set of low-cost materials for use by grass-roots village volunteers. NCP's response was to develop a series of ten interactive counseling cards for communicating priority messages. During individual counseling sessions with parents, the cards helped volunteers focus their advice on specific nutrition-related practices and reinforce verbal messages with images of rural Malians carrying out the proposed behavior.

The principal steps taken to develop the series of counseling cards are illustrated in the following table.

TABLE 9: PRINCIPLE STEPS IN DEVELOPING COUNSELING CARDS

Step 1.	Slides were taken to capture each nutritional practice NCP was promoting.
Step 2.	A Washington-based illustrator was briefed and asked to develop drawings using the slides as a reference.
Step 3.	Color copies of the illustrations were sent to Mali for pretesting at sites close to Bamako.
Step 4.	Recommendations from the pretest were incorporated into the final drawings and text was written for each card.
Step 5.	The counseling cards were printed in Washington, shipped to Bamako, and distributed during training workshops.

3. Carnet familial

In Burkina Faso the experimental educational aid, the *carnet familial*, was developed and tested in Burkina Faso and later offered in Mali to PVO programs. The card, designed to promote interaction between mothers and health workers, was similar in size to a health card and included nine NCP messages and nine illustrated stickers. A field agent would place one or more stickers inside a card during each counseling session to indicate which messages were discussed. Over the course of several sessions all nine stickers would be placed in the card. Most importantly the *carnet* was used to "prescribe" nutrition actions to mothers by placing stickers over messages depicting specific behaviors/actions recommended for a given situation. Women, in turn, could use the *carnet* to report recommended actions to their husbands in the same manner they would if they were asked to purchase medication.

4. Radio Dramas and Spots

The broadcast component was designed to extend the reach, increase the frequency, and reinforce priority messages communicated to rural families. The development of this communication channel was timed to take advantage of an August, 1992, FAO rural radio workshop held in Ouagadougou. This workshop grouped health, agriculture, and communication technicians from five countries for a course in techniques of using interactive village-level interviews, games, and exercises to mobilize grassroots participation. In preparation for the FAO workshop, NCP developed a creative brief which linked research findings with behavioral objectives and message concepts. However, NCP's budget did not include funds to use the FAO-proposed approach (which depends upon an extensive series of radio activities in villages). NCP's focus was on communicating specific priority messages. The project did not therefore follow the FAO model, *per se*, but instead developed a 20-episode radio soap opera designed to address identified behavioral issues.

To assist the CNIECS in developing the radio drama, NCP fielded two radio consultants, journalist Phillip Burnham and Ivorian production expert Antoine Kakou. Malian playwright, actor, and director, Saïdou Touré, was chosen to write the dramatic scripts. NCP's goal was to produce a radio drama which promoted behavioral change by weaving nutrition messages into a realistic village story that would appeal to the population. Draft scripts for the first episodes were written and recorded during the consultants' visit and a production schedule was drawn up. Select episodes were pretested in villages outside of Bamako and at the AFRICARE project site. Following a technical review and revisions, the radio play, *Saheli Sama*, (The Elephant in the Desert) was first aired between July and November 1993 on the National Radio Station (OREM), the only station that reached the rural population in the project zone. Each ten-minute episode was broadcast on Friday at 11:30 am, a popular time because Muslim farmers do not work in the fields on that day. The series featured a recalcitrant father, who with the advice of the community health agent and meddling of various village characters, manages to keep his family on the "Road to Health" through good nutrition. The program was well received, communicating nutrition messages with subtlety and humor.

Prior to launching the drama, ten 30-second spots promoting priority nutrition-related practices were also developed. The broadcast of the spots was organized in such a way that during any given week, the principle message of the spot and the drama were the same.

Six months after the first broadcast of the radio drama, consultant Colin Fraser, a radio communications expert, conducted a five-day workshop for the writers, producers, and health educators who created *Saheli Sama* to discuss revisions to the radio soap opera before rebroadcast.

Fraser's "brainstorming approach" proved very effective in provoking participants to analyze each episode and generate criteria for judging audience appeal, dramatic credibility, and probable impact of messages. The consultant also helped the group develop a realistic work plan for rewriting and recording the radio series. Saïdou Touré, the original script writer, supervised the production of the revised drama which aired a second time in November 1995. After broadcasting the first ten weekly on-air episodes (one episode per week), the National Radio Station began

airing daily broadcasts in response to the numerous listener requests. UNICEF contributed funds for the revisions and for rebroadcasting of the series.

5. Nutrition Field Guide

Based on her research on growth and development in Mali, and the needs expressed by PVO field staff, NCP anthropologist Katherine Dettwyler drafted a training guide for health workers entitled: *How to Identify Children with Malnutrition and Tips for Counseling their Parents*. The guide consisted of a brief, informational text about the consequences of early childhood malnutrition, explained the relationship of nutrition to physical development and illness, and covered the importance of appropriate feeding of children, introduction of solids, and adequate hygiene.

The field guide was reviewed by NCP's partners in Mali and used as the starting point for a three-part series entitled *Communautés en Bonne Santé*. Based on actual field agents' stories and experiences in the villages, the guide aims to help field-level health workers understand basic nutrition concepts, build interpersonal counseling skills, and strengthen techniques for working with grass roots community organizations. Parts I and II of the manual were the basis of the first two series of workshops organized by NCP (see below). Part III was field tested during the third workshop series and later revised.

6. Teachers' Activity Guides

In early 1992, NCP began efforts to strengthen nutrition education in primary schools and non-formal educational programs. Nutrition education in primary schools had not been updated in 15 years. The successful work of the CARE Child Survival Project in using child-to-child techniques to motivate and educate the population in rural villages also helped shape NCP's commitment to this sector. In initial meetings, officials in the Ministry of Education expressed interest in collaborating on the development of a Nutrition Teacher's Activity Guide, provided the guide did not overburden the current academic program.

NCP hired consultant Suzanne Dumas, who had launched the Child-to-Child program for CARE, to develop a working draft of a teacher's activity guide based on her field experience. The draft guide included classroom lessons, child-to-child activities, and ideas for using the school as a focal point and for community-based nutrition program. At the same time, discussions with UNICEF revealed that Ellen Barclay, the Nutrition Officer at UNICEF, had also developed a Teacher's Activity Guide for nutrition that had never been published. Arrangements were made to review both the UNICEF, and NCP guides and to publish one jointly-funded volume.

In June of 1993, a commission consisting of members from the Ministry of Health, the Ministry of Education, UNICEF and NCP, met to consolidate the working drafts into two guides—one for use in primary school classrooms and one for non-formal education settings. The essential approach of these two guides was the same: to encourage community involvement in nutrition education. UNICEF agreed to fund all field activities and NCP covered the costs of consultants.

The completed draft guides were reviewed by NCP consultants, Griet Van Balen and Dandara Kanté, and introduced into ten village education programs through a series of six Training of Trainers workshops in March 1994. Launching the formal guide was held up because of a student and teachers strike that came in the wake of the 1993 devaluation of the CFA franc. In December 1995, the guide was evaluated, re-edited, and more widely distributed in UNICEF programs throughout the country. To accompany the guide, UNICEF ordered \$15,000 of nutrition education materials produced by NCP. This initial activity eventually led to broad collaboration between the two organizations in all program areas.

7. Literacy Materials

The literacy component included a series of three booklets initially printed in Bambara and distributed to CARE, Save the Children, and the National Literacy Service. The overall cost of developing these materials and introducing them into ongoing programs was minimal. Essentially, an additional communication channel was opened for only the expense of printing the booklets. The first two literacy booklets used a simplified text and the same illustrations as the vitamin A flipcharts, while production of the third booklet merely required translating the text of the ten counseling cards, and again using illustrations which had already been developed. No additional training was required to introduce nutrition into the literary program.

The first two literacy booklets were distributed to Save the Children, CARE and the National Literacy Service in mid-1993. Due to the dearth of national language materials, the relevancy of the subject to the rural population's lives (most national language materials available were designed like grade school primers) and the "highly readable" format of the books, they were immediately introduced into the ongoing adult education programs.

In April 1994, during a supervision visit made by Fatima Maiga of CNIECS and Program Officer Peter Gottert to the Save the Children Project site, field staff remarked on the high level of interest that the newly literate adults had demonstrated in the two books. SAVE staff suggested that NCP translate the counseling cards and develop a set of posters in national language for addressing groups of school children attending 40 recently created community schools. In response, NCP helped develop 50 sets of posters in Bambara. Since the number of poster sets needed was small, the text of the counseling cards was simply photocopied on heavy stock and sent out to the SAVE site with poster board for assemblage. By mid-1994, the third literacy book was completed and integrated into two PVO programs.

B. Regional Skills-Building Workshops

Each regional workshop program included individual and group planning exercises to insure that skills learned during practicum sessions would be immediately put to use once the trainees returned to their respective project sites. Because each PVO/NGO had its own program which was frequently divided into monthly themes, NCP designed flexible individual and community-based communication models so they could readily be integrated into all health interventions. NCP materials, especially the flipchart series, emphasize the linkages between nutrition and health

interventions. An overall training goal was to develop an appreciation for how poor nutrition and disease work together to weaken a child. As such, trainees were continually encouraged to focus not only on infant and maternal nutrition as separate program themes but to include nutrition activities as a secondary component of every other theme. For example, during the May 1992 skills-building workshop, CARE staff indicated that their June activity theme would be "safe motherhood" and in July, "control of diarrheal disease." During the activity planning exercise, CARE trainees focused on how to integrate nutrition into these two program themes. With every successive workshop series, nutrition activities played a greater role in each PVO's overall community mobilization programs. Following the third workshop series, PVO field personnel had a complete set of materials to incorporate as constant reminders of the critical role good nutrition plays in maternal and infant health.

1. Series I: Launching the Community-Based Model

In December 1990, at the end of Phase I, NCP collaborated with the Helen Keller International VITAP Project to train 28 MOH and PVO personnel from CARE, AFRICARE, and World Vision. The five-day training introduced the draft field guide, *How to Identify Children with Malnutrition and Tips for Counseling Parents*, and four draft flipcharts. In addition to providing hands-on work with the materials, the workshop included culinary demonstrations and practical activities related to growth surveillance, discussions on the causes of malnutrition, and practice in identifying and counseling high risk-groups.

As follow up, PVO staff tested the flipcharts and counseling approaches and in turn trained grass roots health animators and members of health committees in project villages. Three months later, during supervision visits, feedback collected from the field was used to revise the materials.

2. Series II: Individual Counseling

The second five-day skills-building workshops held in May 1992 focused on strengthening field worker face-to-face communication skills. Approximately 60 PVO and regional MOH staff attended, as well as selected rural development and agricultural agents and teachers. By this time, Phase II activities were well underway and the nutrition network had expanded to ten PVO/NGO partners. Participants from the five USAID-funded PVOs were grouped together for the first workshop because they had considerably more field experience than staff from the newer network members. The second workshop, organized for less-experienced field staff, included more basic nutritional information. This workshop was primarily facilitated by PVO health workers who had participated in the first workshop.

To motivate and reinforce agents' confidence while improving their nutrition counseling skills, NCP produced and distributed during this series of workshops the animator's bulletin, *Sur le Chemin de la Santé*, a professional notebook, *Le Compagnon Villageois*, and motivational buttons as well as stickers for use by community workers.

After the workshops, PVOs trained additional grassroots field staff in implementation of the Five-Step approach and community mobilization activities. The training was followed up by a field monitoring trip by CНИЕCS staff and local NCP consultant Dandara Kanté.

The Five-Step counseling approach, outlined in Table 8, was developed through observation, discussion, and feedback during five technical assistance visits to Mali. The goal of the approach is to assist health workers to systematically assess and act on priority nutrition problems.

3. Series III: Working Within the Community

In November 1992, six months after the Series II workshops, NCP trained PVO agents in techniques of motivating and equipping village-level committees and animators to carry out education activities. Prior to the workshops, a facilitator's orientation was held in Bamako to provide trainers with practical experience in animation techniques and the development of monthly activity plans. The overall goal of the workshops was to provide a basis through which village health committees could assume more responsibility for advocating the principal nutrition behaviors. Workshop sessions included practice exercises and group communication techniques in how to integrate the flipchart series into field activities. Before leaving the workshop, each PVO developed and presented a three-month nutrition activity calendar.

4. Series IV: Effective Community Mobilization

In November 1993, NCP Consultant Erma Wright Manacourt facilitated the fourth series of five-day workshops. She also conducted a ten-day preliminary TOT workshop in Bamako to help CНИЕCS trainers improve and refine their skills in design of workshop programs and conduct of training sessions.

This workshop series focused on Part III of the manual, *Communautés en Bonne Santé*, on community mobilization. In addition to reviewing technical knowledge in nutrition and communication skills, the workshops guided participants through the preparation and implementation of action plans at the community level and included group work on how to conduct feedback and supervisory activities.

Since this was the final training for PVO field staff, the CНИЕCS team led all activities. Dr. Manacourt provided feedback during trainer meetings at the end of each day. During the workshop, additional sets of flipcharts and counseling cards were distributed to PVOs who required them. Literacy booklets and the *carnet familial* were also distributed to PVOs who wanted to integrate these materials into their programs.

5. Series V: Introduction of the Teachers' Activity Guides

In April 1994, NCP consultants Griet Van Balen and Dandara Kanté facilitated a Training-of-Trainers workshop in Bamako to prepare PVO participants to launch the Teacher's Activity Guide for non-formal educational programs. Two weeks later, during workshops held in Tombouctou, Mopti, Ségou, and Tabakoro, the guide was introduced to community teachers working with UNICEF's non-formal education program.

6. Series VI: Community Theater

In October 1994, at the request of Nutrition Network members, NCP/Niger Team Member Habou Kalla led a Training-of-Trainers workshop for CNEICS and UNICEF field staff and the use of community theater to promote nutrition messages. Subsequent theater workshops were carried out in the first quarter of 1995 and funded by UNICEF.

TABLE 10: THE FIVE-STEP COUNSELING APPROACH

1. The agent *evaluates* the problem by talking and *listening* to the mother, as well as using her observational skills, to gain an understanding of the situation.
 2. The agent reflects on her own training and works with the mother to *establish priorities*:
 - a) what problem demands immediate attention?
 - b) what can be discussed during follow-up visits with the same mother?
 - c) what can be discussed in a larger setting with the entire community, or with its health committee?
 3. The agent suggests a *short-term solution for the immediate problem* only, and discusses the feasibility of this solution with the mother. The agent demonstrates the new behavior involved (e.g., mashing bananas, feeding a child with a spoon or finger).
 4. The agent asks the *mother to state what she will do about the problem* over the next week. The agent praises the mother for trying to do the new behavior and says she will come back soon to see how she and the child are doing.
 5. The agent *makes notes* concerning follow-up and community sensitization: When should the agent check back with the mother? Is this a problem that could be brought to the attention of the village health committee? Is this a topic for group demonstration, health chat, or role play activity?
-

7. Other Training Activities

In December 1994, CНИЕCS team members Fatoumata Maiga and Safiatou Tamboura participated in a three-week training in communication techniques and utilization of visual aids in Bobo Diaolasso, Burkina Faso. The workshop was organized by the Research and Group Support Group for the Empowerment of Populations (GRAAP).

V. **ADDITIONAL IMPLEMENTATION ACTIVITIES**

A. **PVO/NGO Nutrition Network Workshops**

Three one- to two-day consultative, planning workshops were held annually at CНИЕCS from 1992-1994. Each of the ten PVO/NGO members of the Nutrition Network sent headquarters and field representatives. Participants also came from UNICEF and the Pivot Group organization. During these workshops, proposed activities were discussed and scheduled. PVO teams made presentations on their field programs and suggested ways NCP could provide additional support for their programs. These workshop were considered by all participants as an excellent forum to exchange program experience.

B. **Monitoring**

All training workshops included sessions on monitoring and feedback procedures. Following each of the first five workshop series, the CНИЕCS team conducted field supervision visits to three or four selected PVO/NGO sites to monitor the quality of nutrition communication interventions. Over the course of the project each of the ten partners was visited at least one time. A typical two to three day site visit to a PVO would include initial discussions with project coordinators, two days of activity observation, and a wrap-up meeting with field personnel to provide feedback and address relevant issues.

Since each PVO program had its own system of organizing field activities, the CНИЕCS team gained considerable expertise in advising partners on effective methods for putting skills and materials to the best possible use. The supervision/monitoring visits, like the planning and training workshops, also served to disseminate new ideas for activities and communication approaches. Following each supervision visit, key issues were discussed by the NCP team and taken into account during the design of subsequent workshops. For example, during a visit to the World Vision site in Koutiala, the supervision team made recommendations on how to transfer skills to the network of 100 village health volunteers and midwives. During the subsequent training series, sessions were devoted to teaching volunteers how to lead education sessions, culinary demonstrations, and conduct home visits.

Initially supervisory teams included external consultants, but this was phased out as part of the transfer of responsibility to the CНИЕCS.

C. Expanded Collaboration with UNICEF

From 1993 on, NCP collaboration with UNICEF expanded on many fronts. In addition to developing the Teacher's Activity Guide together, NCP and UNICEF worked in close partnership on the revisions and rebroadcast of the radio drama, organization of a workshop on village theater, and the adaptation of the ten counseling cards for use in northern Mali by the Taureg people. UNICEF also translated the nutrition counseling guide, *Communautés en Bonne Santé*, into Songrai (a northern language) and purchased flipcharts and literacy booklets for their programs. By March 1995 when USAID funding ended, UNICEF had committed financial support to the PVO Nutrition Network and was working closely with CНИЕCS to extend nutrition education to other regions of Mali. NCP's Local Coordinator for the final 12 months of the project began working full time for UNICEF shortly before USAID funding terminated.

D. Continuation of Field Activities

In early March 1995, the final month of NCP funding, UNICEF and the CНИЕCS held a joint workshop to draw up an activity calendar for the remainder of the year. The calendar represented a complete continuation of NCP activities, including reproduction of the five flipcharts into local languages (Sonraj, Peulh, Tamacheq, and Bamanan); creation of an additional set of counseling cards in Tamasheq; adaption of the radio drama into French, Sonraj, Peulh, and Tamacheq; and elaboration of a training manual on village drama.

UNICEF subsequently changed the name of the project to the Communication Program for Family Well Being. The 1996 workplan for the project calls for introducing the Teacher's Activity Guide on a trial basis at National Teaching and Apprenticeship Centers, conducting an additional series of workshops to expand the number of programs which use the non-formal Teacher's Activity Guide, and the establishment of regional nutrition communication committees.

Following the success of the radio drama, the SOMARC Project also requested CНИЕCS to assist in the development of an additional ten episodes on the themes of responsible sexuality, based on the same characters.

As the project ended, long-term NCP consultant Dandara Kanté was working as the full-time IEC coordinator for the Pivot Group, the health coordinating agency for Mali PVOs. These developments were a great source of satisfaction for NCP and CНИЕCS staff and will contribute significantly to further strengthening the CНИЕCS and consolidating their position as a national communication resource center capable of responding to a broad range of program needs.

VI. EVALUATION AND PROJECT IMPACT

A. Baseline KAP

To evaluate the impact of NCP's program, a study of Knowledge, Attitude and reported Practices, as well as measurements of children's height and weight, was conducted at baseline, mid-term, and end-of-project. Emory University conducted the evaluation in collaboration with the U.S. Centers for Disease Control and Prevention.

In December 1990, the original three PVOs (CARE, AFRICARE, and World Vision) took part in the baseline survey. Dr. Claudia Fishman and NCP consultant Dandara Kanté supervised the study. Each PVO selected eight villages to participate intensively in NCP and child survival activities and eight villages, (matched for socioeconomic and other factors), to serve as "comparisons." The survey used a random sample of 835 women, 524 men, and 657 children in 47 villages. The evaluation team also weighed and measured children under three years of age. In the comparison villages, all usual Child Survival activities⁷ were carried out, but NCP approaches and materials were not used. At the baseline, the entire sample of villages was fairly homogeneous in terms of nutritional status and indicators used to assess knowledge, wealth, food supply and other factors that might confound the study.

The findings were roughly comparable to the national level data from the 1987 Demographic Health Survey. Malnutrition was found to be pervasive among children under three:

- 14% were acutely malnourished
- 42% were moderately or severely malnourished
- 40% were chronically malnourished or stunted.

Other important survey results included:

- Among the 600 children 1 to 36 months of age who were measured, approximately 42% were malnourished using weight/age Z-score equal or less than -2 standard deviation (SD) below the NCHS reference.
- 13% of the children measured were equal to or less than -3SDs below the NCHS reference.
- A number of cognitive factors were found to be associated with positive nutritional status, including mother's knowledge of the physical signs of wasting and malnutrition and father's knowledge and attitudes about children's nutritional needs.

⁷ E.g. immunization, water hygiene, oral rehydration therapy, safe motherhood, family planning.

B. Mid-Term, 1993

In February 1993, CARE/Macina discontinued their health program for internal financial reasons and withdrew from NCP activities. However, since CARE had innovated and tested much of the project's strategy, NCP rapidly implemented a small-scale evaluation at that time to provide feedback to CARE and the USAID Mission on NCP's impact to date. During this "mid-term" evaluation, four "trial villages" and four "comparison" villages from the original group were examined. Following approximately two years of intervention, there were fairly dramatic differences between villages enrolled in NCP compared to non-NCP villages in terms of children's nutritional status, key maternal and child dietary practices, and in parents' attitudes and knowledge.

Indicator	Baseline N = 212	Control N = 58	Trial N = 59
Proportion acutely malnourished using weight/height less than -2 SD	14.0%	17.24%	4.55%
Proportion malnourished using weight/age less than -2 SD	44.4%	37.9%	21.1%
Proportion chronically malnourished using height/age less than -2 SD	40.1%	40.34%	42.0%

As can be seen above, the prevalence of acute malnutrition in the participating villages was only 4.5% compared to 17% in the control villages and against the baseline of 14%.

Specifically, in the small, but statistically meaningful, sampled populations:

- **The prevalence of acute⁸ malnutrition was reduced by 64%. (Baseline=14%, Mid-term trials=4.6%, comparisons=17.2%) General malnutrition⁹ was cut in half (42% baseline, 22% trials against 38% comparisons). There was no impact on chronic malnutrition.**
- Using indexes of wealth and food security, while children in the trial villages came from marginally wealthier households at both baseline and midpoint, **all improvements in weight for age were achieved by trial children in the lower 50th percentile of wealth.** Children in the upper 50th percentile of wealth, in either trial or comparison villages, showed no change in weight for age from baseline measures.

⁸ Weight for height less than -2 standard deviations below the international standard.

⁹ Measured using Weight-for-age less than -2 SD below the median.

- Women in the trial villages reported consuming more foods stressed by the intervention (e.g. peanuts, vegetables, milk) and a higher proportion fed their children recommended foods (specifically porridge, milk, peanuts and vegetables) than in comparison villages.
- The proportion of women in trial villages who believed that infants should be exclusively breast-fed effectively doubled from the baseline, while it declined slightly from a previously higher starting point in the comparison villages. Both father's and mother's intentions to chose healthier foods for their children increased only in the trial villages, and declined slightly in the comparisons.
- Adults' ability to recognize the symptoms of child malnutrition in a picture increased at both trial and comparison sites—however, adults' knowledge that *eating appropriately prevents malnutrition increased significantly and substantially only in trial villages.*

It is important to note that routine MOH/CARE nutrition activities took place in comparison villages including one arm circumference screening for malnutrition (in 1991), enriched porridge demonstrations, and "community problem diagnosis and consensus building" for nutrition using GRAAP flannelographs. The health workers who participated in the experiment believed the difference between NCP Trial and Comparison villages was most attributable to their use of the **systematic, interactive counseling approach** developed by NCP.

While these samples were small, they produced statistically significant results¹⁰. Following the mid-term assessment, CARE began implementing NCP approaches in conjunction with the other child survival interventions in the comparison villages, destroying the original evaluation plan for NCP/Mali, but clearly benefitting the population, based on these mid-term results. For administrative reasons, CARE/Macina ceased total operations for about 1 year after that time, and all trained staff were released during this period. The project re-started in January, 1995.

C. Final Evaluation

As explained above, CARE/Macina ended the health component of their project in early 1993, leaving Africare/Dioro and World Vision/Koutiala from the original KAP longitudinal design. Pre- and post-intervention comparisons were made for these two NGOs. As Save the Children in Kolondieba had been an active participant in NCP from the first training, and was able to participate in the 1994-95 survey, data collected from their project site were added for a cross-sectional analysis of impact in relationship to exposure to NCP interventions.

¹⁰Fishman, C., Tohde, F., Thiam, A., & Kanté, D. "Knowledge, Attitudes, Reported Practices and Anthropometric Indicators of Children's Nutritional Status"- Midpoint Assessment of the Nutrition Communication Project - Macina Circle. Washington, D.C. Academy for Educational Development, February 1-5, 1993.

1. NCP Reach

- Where the NCP intervention was conducted (trial villages), approximately **50% of the women and 30% of the men** sampled in the 1994 survey *remembered* at least one intervention of five tested. **Among women, 10% could recall two different counseling media, and an additional 6% saw these interventions as well as remembered the radio program.**
- Where NCP was not intentionally deployed (comparison villages), 18% of the women and 6% of the men reported seeing an NCP flipchart or counseling card. As the child survival coordinators could attest, NCP materials were well-liked and became spread around the region (beyond the trial areas). This fact weakens, but does not entirely nullify, the validity of "exposure categories" used to assess NCP's impact.

2. NCP Impact

The survey results indicate that **NCP improved maternal diet, child feeding behavior and children's growth**. This is true whether the project's impact is examined over time (i.e., before/1990 and after/1994-95), or in relationship to the strength of a village or an individual's exposure to NCP media. All findings reported below are significant.

Impact Pre-and Post NCP

- The prevalence of malnutrition (weight for age), was reduced from 38% to 28 % (a 26% reduction) in trial villages, while it remained virtually unchanged (1% point increase) in comparison villages.
- Chronic malnutrition, or stunting, was reduced from 46% to 31% (a 33% reduction) in the trial villages, while there was no significant change in comparison villages.
- Giving children colostrum (first breastmilk) more than doubled in trial villages (from 25% to 58%) compared to a 12 point change (30% to 42%) in comparison villages.
- The number of mothers in trial villages not giving infants water until after four months doubled over the baseline level (from 10% to 21%) compared to a 6 point change (11% to 17%) in comparison villages.
- Mothers in trial villages were far more likely to introduce porridge, fruit, green leafy vegetables, cow's milk, and meat or liver into a child's diets—and in a timely fashion—than mothers in comparison villages¹¹.

¹¹ Porridge (trial 53%, comparison 42%); fruit (trial 27%, comparison 11%), cow's milk (trial 22%, comparison 14%), greens (trial 21%, comparison 7%), meat/liver (trial 35%, comparison 14%).

Impact in Relationship to NCP Exposure

There was a positive relationship between length of time a village participated in NCP and improvements in children's measurements. When multi-variate statistical techniques were used to examine these relationships, it appeared that:

- Children over six months of age were twice as likely to have a satisfactory general nutritional status (weight/age) if the child's mother *remembered two or more NCP counseling contacts or materials* ($p=.008$). Recalling NCP media was the only significant factor in an analysis that also included having been vaccinated, filtering water, and having a positive wealth measure.
- Using a similar analysis as above, children over six months of age were **3.4 less likely to be stunted** (unsatisfactory height/age) if the child's mother *remembered two or more NCP counseling contacts or materials*.
- Neither the presence of child survival activities alone, nor socioeconomic factors alone (particularly wealth indices), or a combination of these factors without NCP, were associated with improved nutritional status. This was tested in a multitude of ways. Sickness two weeks prior to/during the survey was the only variable associated with wasting.

NCP exposure was also highly correlated with increases in several promoted behaviors.

- **Men purchased more healthy foods for women and children.**

NCP was a *better predictor* of whether a man gave money to his wife to purchase food, or brought recommended foods home for his family to eat, than being in the upper 50th percentile of wealth as measured in the survey. Men who learned that "liver can prevent or cure night blindness" purchased liver on average three times during the two-month period preceding the survey, in contrast to a one time purchase by those who had not learned this concept. Other NCP messages concerning women's and children's need for liver, or the man's role in providing for this need, were also associated with increases in purchasing (1.7 and 1.5, respectively). This combined analysis was significant ($p=.000$).

While NCP radio spots had only been on the air for a short period, 63% of those who heard the spots purchased meat for their families in the two weeks prior to the survey, compared to 47% who had not heard the spots. (Chi sq. $P=.003$).

- **Women and children consumed greater amounts of healthy foods.**

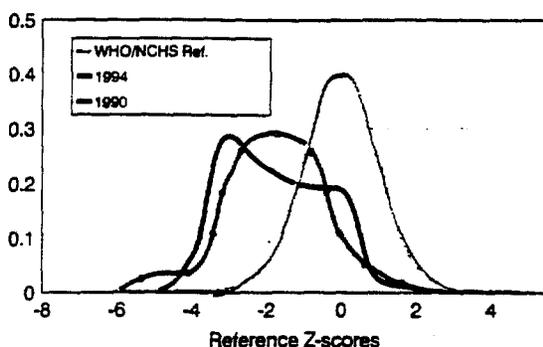
For example, women who remembered one of several messages from an NCP flipchart were twice as likely to report consumption of liver in the past 24 hours as women who did not see or remember an NCP message.

- Caretakers report better child feeding practices.

For example, 60% of 147 women who recalled seeing NCP counseling cards knew that a small bowl could be used to purposely feed a child an adequate portion of food. Of the 546 women who had *not seen the card*, 59% had learned about using a bowl from a community agent, a health worker, a village volunteer or the radio—which were all NCP vehicles. Women who actually saw the card were more likely to use a bowl for this purpose, suggesting that visually-supported counseling is more effective.

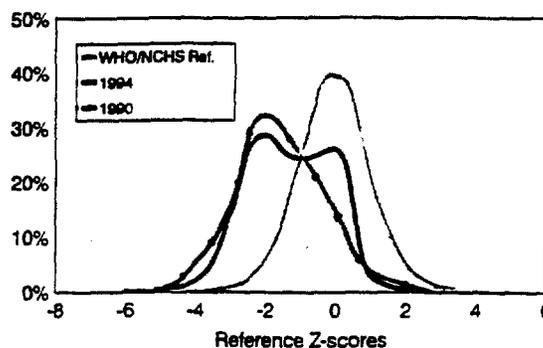
Women who remembered NCP counseling cards were more likely to learn to be patient and use small portions when feeding sick children (61/172 women) compared to those who did not see cards (8/540). Women who had learned these specific recuperative feeding skills had children whose overall nutritional status was the best in the entire survey, followed by those who learned about special foods, or about generally encouraging sick children to eat. Remembering the NCP message to feed sick children patiently and/or with small portions alone was associated with more than half a standard deviation difference (.6 SD change, in an analysis combining other messages, $p=.01$; examined alone, $p=.005$). *These children were likely to have a normal nutritional status (compared to international reference data) in contrast to other children.*

Pre-Post Weight/Age Distribution
Comparison Villages 1990-1994



1990 N=182, Mean WAZ=-1.8, SD=1.3
1994 N=122, Mean WAZ=-1.8, SD=1.3

Pre-Post Weight/Age Distribution
Trial Villages 1990 - 1994



1990 N= 201, Mean WAZ=-1.6, SD=1.3
1994 N= 233, Mean WAZ=-1.3, SD=1.2

Weight for Age and NCP Counseling Cards

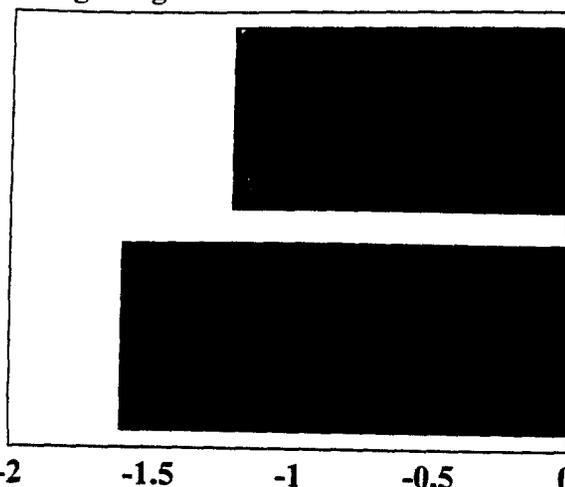
Weight/Age Z Score

Mother remembers card # 10

N=137

Didn't See/remember card

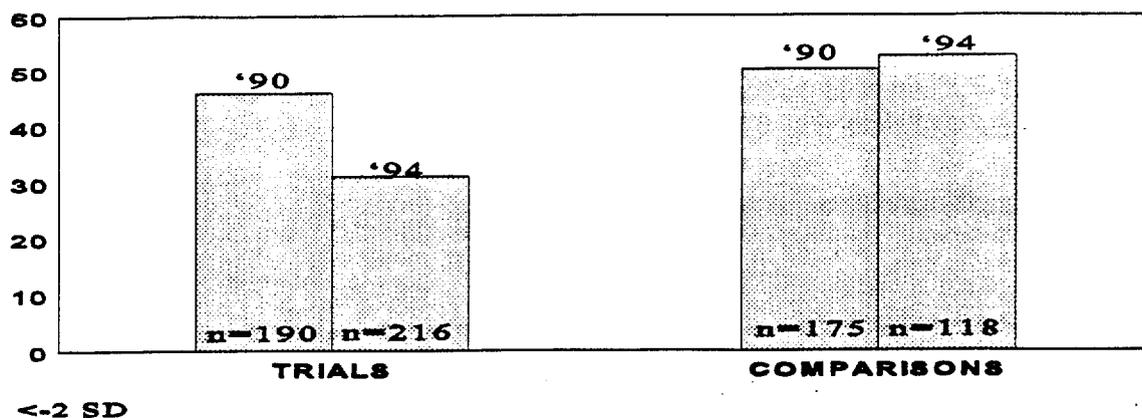
N=436



Mothers of children > 6 months, N= 573 ANOVA $p=.007$

52

Percent of Stunted Children



3. Programmatic cost savings

The evaluation indicates that whether the Child Survival project relied on village volunteers or professional nurses, a similar positive impact on nutritional status was achieved where NGOs used NCP approaches and materials.

These findings suggest that within rural, Malian communities, improvements in nutritional status:

- can be achieved by integrating nutrition into other child survival interventions;
- can be obtained by incorporating low-cost communications (staff training, flipcharts, counseling cards) in child survival programs;
- do not require increases in household income.

The child survival literature now indicates that nutritional status is responsible for up to 56% of a child's likelihood of living or dying in the first 5 years¹². NCP improved the chances for approximately 760,000 people taking part in the community-based component of the program in Mali, while the radio broadcasts had the potential of reaching any Bambara speaker in the country (of 9 million people). The reduction in child malnutrition alone achieved through NCP activities is estimated to have prevented the deaths of approximately 850 children per year by the end of the project.

VII. LESSONS LEARNED AND RECOMMENDATIONS

In March 1995, a two-day Lessons Learned Workshop was held in the CНИЕCS conference room in Bamako. The opening session was attended by members of the NCP Technical Committee,

¹² See Pelletier, D.L., Frongillo, E., J-P. Habicht, 1993. Epidemiologic evidence for a potentiating effect of malnutrition on child mortality. *AJPH* 83:1130-33.

UNICEF, the National Teaching Institute, three American PVOs, and USAID. Ms. Maiga, one of the two CНИЕCS agents assigned to work with NCP, opened the workshop with a presentation of the overall program objectives, strategy, and activities. Principal recommendations and lesson are noted in the final section of this report. The following section summarizes the conclusions from the two-day Lessons Learned Workshop held in Bamako, including results from the final evaluation and observations by NCP staff.

A. Project Design

The NCP/Mali project design, in which interventions were implemented by well-established PVOs and then expanded to the MOH and other less-established PVOs, facilitated the progressive transfer of responsibility to the MOH and network PVOs. During the pilot Phase, the MOH was a program partner, but activities were driven principally through three USAID-funded PVOs.

Working with the PVO/NGOs had several advantages:

- **Integration.** By linking up with ongoing programs, NCP was obliged from the beginning of its field activities to find ways of integrating nutrition education into other health interventions.
- **Rapid start-up.** The PVO projects had momentum that NCP was able to tap into, thereby reducing the time needed to move into an operational phase.
- **Favorable environment for change.** By working through established community programs run by PVOs, NCP was able to benefit from a foundation of trust and an environment that was favorable to change.
- **Information exchange.** The regular meetings of PVOs working on the nutrition project served as a forum for a cross-fertilization of operational approaches and successful activities. A subtle, healthy sense of competition between the PVOs probably boosted the project's overall impact.
- **Flexibility to incorporate innovative interventions.** The NCP program might have been stronger had the local team had more time and human resources. In 1992, NCP realized that village theater presentations were working well in Niger. However, because the Mali project team was fully occupied with implementing its activity plan, two years elapsed before there was time to do the necessary training to orient village theater troupes to nutrition issues.

B. Institutional Development

NCP was the first project to work with the newly created CНИЕCS. Following four years of collaboration, the technical capacity and the reputation of the CНИЕCS grew impressively. Since 1993, NGO health projects have increasingly turned to the CНИЕCS for assistance with materials development, radio production, and training on a fee-for-service basis. Within the government,

CNIECS plays a key advisory role. In addition, NCP created opportunities for a cadre of recent Malian graduates in theater and fine arts to apply their new skills to health promotion. These approaches have been added to the curriculum of development communications within the National Teacher's College of Mali.

C. Sustainability

The continuation and expansion of NCP activities with UNICEF funding is a source of great encouragement to all members of the PVO/NGO nutrition network. At the end of the project, activities continued without interruption to be coordinated by the CNIECS. Katerina Sissoko, NCP Local Coordinator for the final eight months of the project, began working for UNICEF full time in January 1995.

Fostering a Common Approach Among PVOs

Under the direction of the Child Survival project managers at USAID, PVOs with mission grants met quarterly to report on their progress and constraints. NCP had access to this meeting, and worked to transform it into a forum for sharing operational approaches and successful activities. The "nutrition umbrella group" evolved into the Groupe Pivot for health concept that USAID/Mali instituted in 1990-1991 to support PVOs with technical assistance, training, and informational support. By 1995, the Groupe Pivot for health and nutrition was a freestanding network of international and Malian PVOs. NCP consultant, Dandara Kante, was its first IEC coordinator.

Government-NGO Collaboration

NCP contributed substantially to the creation of a functional Nutrition Network made up of three government ministries (Health, Education, Information), ten PVOs, UNICEF, and FAO. The group met to draft Mali's statements for the International Conference on Nutrition, and subsequently to develop the National Nutrition Plan of Action. The government plans to implement a number of these programs over the next five years.

Regional Approach

NCP created a network for West African programs to share nutrition materials and experimental results across countries—with each program taking one step beyond where the other left off, rather than covering the same ground at the same rate. This collaborative spirit was instigated by the first regional NCP workshop held in Abidjan in 1989, and was reinforced by regularly bringing country personnel together (e.g., at the Lomé forum in 1991 and the FAO Sahel vitamin A communications workshops) and by encouraging PVO staff to send agents to neighboring country NCP training. NCP also used "star"performers from one county as consultants to others in the region. This sharing was both educational and motivational for the Mali consortium, and overall, kept their performance at the cutting edge of what was being achieved in Africa.

Interregional Exchanges

All activities involving interregional exchanges among project personnel were highly effective and

much appreciated by those involved. Staff working on NCP projects made two technical assistance visits. Dandara Kanté, who was the IEC Coordinator in Mali, visited Niger to conduct a TOT workshop; and Habou Kala, from the Niger team, conducted a TOT in Bamako on the use of village theater. These visits were not only effective in their own right but also were a source of motivation for both project teams. More of these exchanges would have been beneficial to the various country projects.

NCP also devoted itself to strengthening the National University of Côte d'Ivoire, Center for Research and Teaching in Communication (CERCOM), to serve as a regional source of technical assistance. CERCOM faculty were fielded on two technical assistance missions to Mali, which were highly appreciated by the consortium. CERCOM also conducted evaluations of NCP activities in Burkina Faso and Niger.

D. Print Materials Well Adopted to Their Context

The series of five NCP flipcharts were well-suited for use by projects working on child survival issues because most project sites had full-time village *animateurs* who held regular group education sessions and made home visits. These *animateurs* worked closely with organized village health committees. As in Burkina Faso, the workshop participants praised the flipcharts for their ease of use, durability, and portability. Community educators could use them flexibly in working with groups and individuals.

The counseling cards complemented the flipcharts and were used without difficulty by nonliterate village volunteers. The volunteers reported that the cards increased their credibility and prestige in the village. The cards also improved the quality of the volunteers' counseling by focusing attention on the key messages.

Approximately 30% of the costs of the flipcharts (and considerable time) was saved by printing the series for both Mali and Burkina Faso at a well-equipped shop in Ouagadougou, the capital of Burkina Faso.

E. Radio

The radio drama has been popular among rural audiences. In response to requests from listeners, the National Station decided to run the dramatic episodes every day instead of once a week, and the series has been rebroadcast free of charge several times since then.

F. Technical Assistance

Workshop participants expressed appreciation for the inputs of NCP consultants. In particular, radio consultant Colin Fraser and training consultants Erma Manacourt and Habou Kala were highly regarded for their technical proficiency and ability to work well with project staff. National counterparts indicated that they expect consultants to be highly experienced, able to apply their expertise to the local situation, and capable of involving local staff in problem-solving and decision making.

VIII. CONCLUSIONS

In sum, NCP's presence resulted in:

- Significant improvements in the nutritional status of 149,900 children between 0 and 5 years, and 170,500 rural women.
- Adoption of a range of healthy nutrition behaviors by mothers and fathers in rural communities.
- A cadre of approximately 150 government and privately-funded health workers trained in nutrition assessment and counseling.
- A spectrum of culturally-appropriate, field-tested educational materials for nutrition counseling and promotion.
- A continuing radio drama on health that has achieved such popular support that it now airs daily.
- The updating of nutrition education in primary schools and a cadre of 70 trained teachers.
- Creation of a functional government-NGO Nutrition Network
- The development of a well respected, experienced, results-driven health information, education and communication center within the MOH.
- Strengthening of the "Pivot Group for Health" in formative and evaluation research as well as nutrition communication strategy development.
- The institutionalization of "development communications" within the curriculum at the National Teacher's College and the regional university in Côte d'Ivoire.

At the end of the project, UNICEF had become the primary Malian donor for "NCP" activities with CНИЕCS charting the course. The World Bank is currently developing a new project that will allow the government of Mali to undertake community-based nutrition promotion on a national level.

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APPENDIX

Nutrition Communication Project-Hard Data and Lessons Learned, April 9, 1996.

Mali Impact Evaluation-Key Results and Support Data

Background Information: *Sample Population*

Villages in Dioro, Koutiala and Kolondieba are include in the cross-sectional analysis; Dioro and Koutiala only in the pre-post analysis. While some data are missing from some analyses, the numbers included, unless otherwise indicated, appear in Table 1 below.

Table 1 Cross-Sectional Sample, 1994

Category:	Total	High NCP	Intermediate	Low/No
Women	712	337	187	188
Men	354	169	92	93
Children	845	388	227	230

Of the 845 children in the total sample, 823 (97%) had sufficient data to analyze weight/age and 796 (94%) had sufficient data to analyze height/age.

Comparability of sites

Household characteristics -No significant differences among intervention classifications

Table 2 Demographics

Monogamous	49%
Polygynous: Woman interviewed by "marriage" order:	51%
1 st	48%
2 nd	41%
3 rd	10%
Mean age of children in sample-1990	13.0 months
Mean age of children in sample-1994	16.0 months
Boys in sample	444
Girls	412
Mean number of children per household	4.3

NB: The older children in the 1994 survey theoretically would have worse growth results than the younger children in the baseline.

Child Survival Program Input

Table 3 CS Variables in 1994 survey

	High NCP	Intermed. NCP	No Low NCP
Pump for water source	30%	30%	40%
Filter water (also influenced by NCP)	47%	31%	22%
Vaccination card	58%	67%	66%
Measles vaccine	40%	44%	43%
Received Vitamin A capsule	12%	10%	15%

Wealth

As more "trial" villages in the pre-post analysis come from Koutiala, and more "comparison" villages come from Dioro, it was necessary to separate out the effects of both "region" and "associated wealth." Using a 12 point wealth scale, shown below, a difference in mean wealth was observed in the sample drawn for the pre-post study in 1994 that did not exist in 1990. This is due to proportionally more trials coming from Koutiala, a wealthier region, whereas proportionally more comparisons came from Dioro, a relatively poorer region. It is not that conditions actually shifted in the areas-but that the pre-post sample is skewed.

Table 4 Differences in Ownership of Household Items and Livestock, 1994

Household Item and "point value"	Trial	Comparison	Significance
Donkey (2)	67%	36%	.001
Cart (2)	71%	47%	.005
Working Radio (1)	59%	30%	.003
Bicycle (2)	76%	38%	.00001
Chicken (1)	76%	57%	.05
Sheep (1)	54%	57%	NS
Cow (2)	71%	66%	NS

Table 5 Mean Wealth 1990, 1994, Trial and Comparison Groups

Group	Mean Wealth	N	Significance
TRIAL-1990	4.9	198	NS, p=.60
Trial-1994	5.1	221	
Comparison-1990	5.3	121	.0000
Comparison-1994	2.9	176	

Whether this difference in wealth makes a difference in anthropometry is examined in section 5 below.

Project Impact

1. REACH

The bottom line reach of NCP is about 50% of women, and 30% of men saw at least one intervention. Among women, 26% received an exposure score of 3 or more, with 10% remembering both flip charts and counseling card sessions, and an additional 6% saw these interventions as well as remember the radio show. Approximately 22% of men also received an exposure score above 2.

Table 6 NCP Media Exposure Scoring

NCP Intervention	Possible Maximum Score		No. of Women (All) Scoring (N=712)	
	Commun. Agent/ Volunteer	Other Channel	2 Points	1 Point
1-Saw Awa Flip Chart-Picture of Man Buying Liver @ Butcher	2	1	57	35
2-Counseling Card # 10-Healthworker administering "solution" to malnourished child in mother's lap	2	1	107	65
3-Counseling Card # 5-Feeding children w/separate bowl/spoon	2	1	100	47
4-Play or sketch concerning buying liver for family {Fsketch}	1		39	
5-Flip chart concerning buying liver for family {Fboite}	1		32	
6-Radio program concerning buying liver for family {Fradio}	1		47	

Individual exposure score was calculated based on the first 5 interventions above (radio was handled separately as its range was not limited to the NCP trial or high exposure sites). A maximum score of 8 was possible if the individual saw each NCP intervention through a community agent, as well as saw a sketch and participated in a flip chart session.

Table 7 Mean Exposure Score by Intervention Group

Category:	Exposure Scores			
	High Mean	Intermediate Mean	Low/No Mean	Sig.
Women	2.06	0.66	.43	.000
Men	1.34	.79	.31	.000

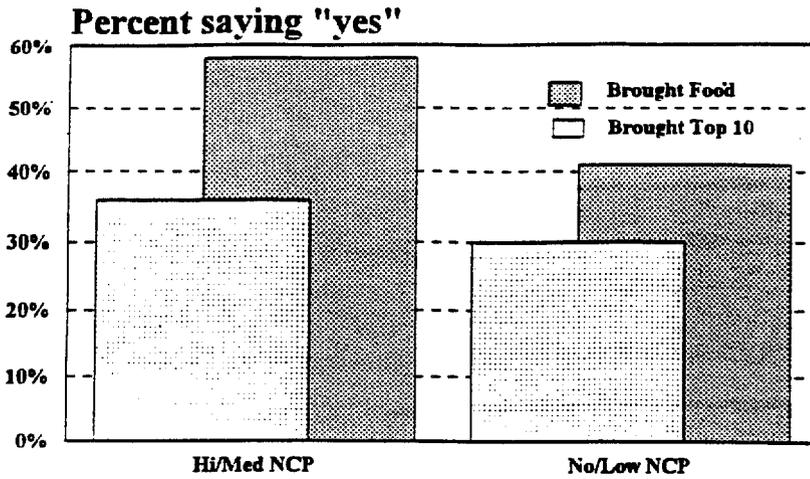
Percentages of individuals receiving scores 0-8 in the sample participants *presumably exposed* to NCP (i.e. high and medium exposure villages), N=785, follows in Table 8:

Table 8 NCP Exposure Scores for Target Audience Groups in High/Medium NCP Villages

Score	Pregnant Women N=111	Moms: 0-6 months, N=71	Moms: 7-36 months, N=342	Men, N=261
0	54.1 %	53.5	52.6	71.6
1	15.3	12.7	11.7	5.4
2	6.3	14.1	12.6	1.1
Maximum Impact in Group Below: Total	24.3%	29.7%	23.1%	21.9%
3	7.2	5.6	7.9	9.6
4	.9	1.4	1.5	1.5
5	8.1	0	4.7	2.3
6	1.8	8.5	2.6	4.2
7	.9	0	0.3	0
8	5.4	4.2	6.2	4.2

2. **PURCHASING BEHAVIORS**

Man brought food home for family

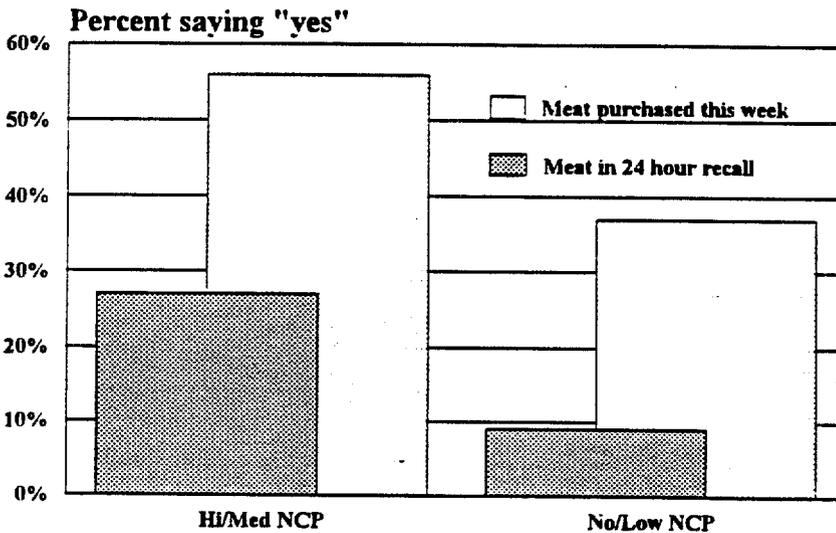


3. **DIET**

Table 9 24 Hour Recall Data

Women in High/Intermediate NCP ate more:	Women in No/Low NCP ate more:
Porridge, leaf sauce, tomatoes, bananas, green beans	Peanuts, milk
Children in High/Intermediate NCP ate more:	Children in No/Low NCP ate more:
Porridge/toh, rice, leaf sauce, green beans, bananas	Animal milk

Mom also eats what she buys



Among pregnant and breastfeeding women, N=245, p=.005

4. FEEDING BEHAVIOR

Table 10 Reported Breastfeeding and Timely Introduction of Complementary Foods

Infant Feeding Practice	1990 Trial n=271	1994 Trial n=196	TRIAL Change	1990 Comparison n=260	1994 Comparison n=97	COMP Change
Give Breastmilk First	25 %	58 %	+33	30%	42%	+12
Introduce water after 4 months	10%	21%	+11	11%	17%	+6
Feed Porridge @ 6-8 months	33%	53%	+20	27%	42%	+15
Feed Fruit @6-8 months	12%	27%	+15	8%	11%	+3
Feed cow's milk @ 6-8 months	NA	22%		NA	14%	
Feed leaves/leaf sauce @ 6-8 months	NA	21%		NA	7%	
Feed Meat/Liver @ 6-10 months	18%	35%	+17	16%	14%	-2

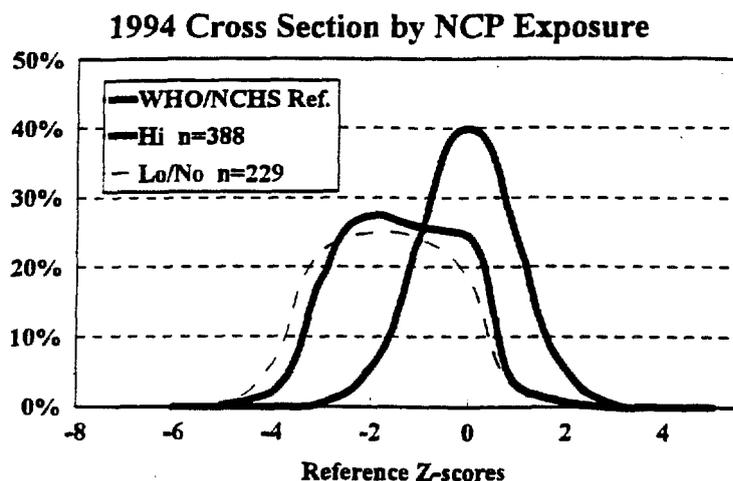
5. CHILD CARE SKILLS

Table 11 What mothers learned from Counseling Card No. 10

Saw Counseling Card No. 10	High N=101	Intermediate N=57	Low/No N=14
Learned about ORT or that sick children need to be encouraged to eat (p=.01)	11 (14%)	6 (10%)	2
Learned to be patient and give sick children small portions (p=.00000)	61 (60%)	31 (54%)	8
Learned about enriched porridge, bananas and other foods for sick children. (p=.01)	43 (43%)	29 (50%)	7

5. Nutritional Status

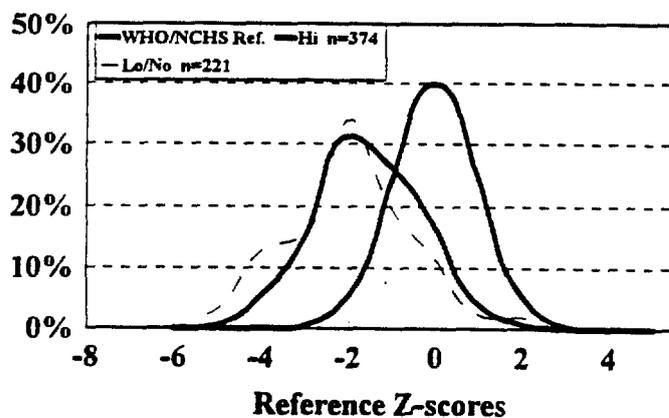
Weight/Age Distribution



Hi NCP, Mean WAZ=-1.3, SD=1.1
Low/No NCP Mean WAZ=-1.8, SD=1.2. Sig. p=.0001

Height/Age Distribution

1994 Cross Section by NCP Exposure



Hi NCP, Mean HAZ=-1.5, SD=1.3
Low/No NCP Mean HAZ=-1.9, SD=1.5. Sig. p=.001

Table 13 Descriptive Statistics for Anthropometric Indicators of Nutritional Status for Children in Cross-Sectional Sample, 1994

Indicator	Children 0 - 3 Years of Age						Signif.
	High. N=388		Intermediate N=226		Low/No N=229		
Mean Weight/Age Z-Score	-1.33	SD 1.18	-1.78	SD 1.14	-1.66	SD 1.14	p=.0001
Mean Height/Age Z-Score	-1.51	1.26	-1.74	1.23	-1.92	1.46	p =.001
Mean Weight/Height Z-Score	-0.69	1.06	-0.91	1.14	-0.78	1.09	p=.06 (NS)

Multivariate Analyses

The following variables were examined in a logistic regression equation: NCP MEDIA RECALL SCORE ABOVE 2; Child Survival Project variables: (1) Have Immunization card; (2) Filter or Boil drinking water; Wealth variables: (1) Equipment above sample 50th percentile; (2) Livestock above sample 50th percentile. Only children older THAN 6 MONTHS OF AGE are included. A total N of 436 children had adequate data to complete this analysis.

odds of children having weight-for-age scores better than -2 standard deviations of the WHO reference. Other variables have no significant impact on weight-for-age (positively or negatively) when examined in this model. Similar results were obtained when we examined height-for-age (chronic malnutrition).

Table 14 Logistic regression Model for Weight-for-Age

Variables in full model	Odds	95% C.I.	Sig.
Individual Media Exposure >2	2.04	1.52, 2.57	.008
Variables Dropped from Model			
Treat Water			.96
Immunization card			.41
Equipment above 50th percentile			.83
Livestock above 50th			.84

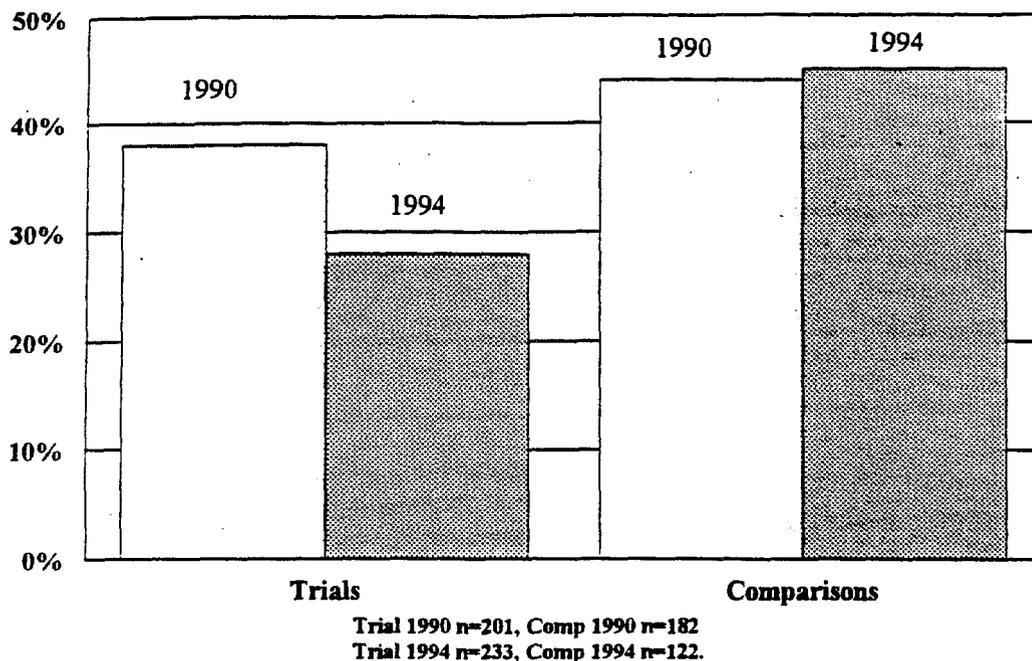
Table 15 Logistic regression Model for Height-for-Age and Child Survival

Variables in full Model	Odds	95% C.I.	Sig.
Individual Media Exposure >2	3.37	2.80, 3.94	.0000
Variables Dropped from Model			
Treat Water			.11
Immunization card			.26
Equipment above 50th percentile			.48
Livestock above 50 th			.50

This model suggests that when NCP exposure, Child Survival and Wealth variables are modeled simultaneously, NCP exposure variables increase the

B. Pre-Post Analysis (1990-1994)

**Percent of Malnourished Children
based on Weight-for-Age less than -2S.D
1990-1994**



Mean Weight/Age : MANOVA

Case	Time	WAZ
Trials	1994	-1.3
	1990	-1.8
Comparisons	1994	-1.8
	1990	-1.6

Design	Time within Case	F	WAZ	p-value
1994		5.82	-1.3	p=.02
1990		0.40	-1.8	p=.53 (NS)

Within wealth category (wealth score greater than 5="richer")

Within "poorer"

Time within CASE

Year	Time	WAZ
1990	Trial	-1.8
	Comparison	-1.6
1994	Trial	-1.5
	Comparison	-1.7

Within Poorer:

Change within Trial group by Time

Decrease in percent malnourished

-3SD F=1.09 p=.3 (NS)

Change within Comparison by Time

Increase in percent malnourished

.1SD F=.26 p=.6 (NS)

Within "richer"

Time within CASE

1990

Trial

-1.5

Comparison

-1.7

1994

Trial

-1.1

Comparison

-2.0

Within Richer:

Change within Trial group

Decrease in percent malnourished

-.4SD F=5.49 p=.02

Change within Comparison

Increase in percent malnourished

2SD F=.73 p=.39