The Mass Media and Health Practices Evaluation in Honduras:

A Report of the Process Evaluation

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EXECUTIVE SUMMARY

This is a report of the findings from the process evaluation of the Mass Media and Health Practices Project in Honduras. The project was an undertaking of the Ministry of Public Health, with technical assistance from the Academy for Educational Development. It was known in Honduras as the Proyecto de Comunicacion Masiva Aplicada a la Salud Infantil (PROCOMSI). The project and the evaluation were funded by the Office of Education and the Office of Health of the Bureau for Science and Technology, United States Agency for International Development (USAID), with additional support from the USAID Mission in Honduras and the Ministry of Public Health. The evaluation was performed by the Institute for Communication Research and the Food Research Institute of Stanford University and by Applied Communication Technology.

The purpose of the PROCOMSI project was to introduce oral rehydration therapy (ORT) and other behaviors related to the treatment and prevention of infant diarrhea in rural Honduras. The target behaviors included treatment of acute cases, preventive actions that mothers could perform, and related nutritional and breastfeeding activities. The treatment behaviors involved the administration of an oral rehydration solution mixed from packets of salts containing the World Health Organization ORT formula. The packets were manufactured in Honduras and distributed at clinic and community levels by the Ministry of Health.

The project and the evaluation were also designed to test the efficacy of an intervention strategy that tied elements of several different approaches into an integrated campaign. The PROCOMSI intervention used broadcast, print, and interpersonal communication channels to deliver a coordinated set of messages about a fairly narrow set of issues -- responses

to infant diarrhea. The knowledge and behavioral objectives and the strategies for behavioral change were developed using intensive planning research and the principles of behavioral analysis. The campaign incorporated elements of social marketing and systematic development of messages using formative evaluation.

The evaluation design included a number of studies with different methodologies, but relied primarily on large-scale survey data from repeated visits to a panel of mothers of small children. A sample of roughly 750 mothers was selected from 20 communities; these mothers were visited monthly for interviews about various aspects of the campaign. Examples of the other study approaches include anthropometric measurement, behavioral observations, community mortality, interviews with health professionals, and ethnographic observation. This paper is the report of the findings from the process evaluation study. The purpose of the study was to explore, using ethnographic methods, the process of adoption of the promoted changes.

The study was carried out in two communities, with extended, repeated visits over a two year period. Families were censused, interviewed with and without protocols, and observed during that time.

The paper presents the construct of explanatory models, conceptualizations used by inhabitants of the rural areas, known as countrypeople, to interpret, explain, and predict disease processes. The models used by countrypeople differ from those used by "cosmopolitan" medicine to describe the same event. Because the models differ, they generate different decision frames and actions. The major consequence of this is that health related information is usually devised by people implicitly using cosmopolitan models, and may not be consonant with countrypeople's perception of the situation. Hence, it may be ignored or

resisted.

The paper examines the situation for diarrheal disease, with particular reference to a folk diagnosis called "empacho," which might be loosely translated as indigestion. Empacho is not seen by the people studied as a member of the class of diarrheal diseases that are susceptible to treatment using oral rehydration therapy. For this reason, cases of diarrhea that the countrypeople perceived to be empacho tended not to be treated with ORT.

Structured interviews were conducted with families in the study communities. The quantitative data from the interview and the qualitative data from observation are integrated into a description of the local context. The description includes: the traditional and "folk" medical systems in Honduras; the social context; characteristics of the study communities; analysis of the domestic context, such as physical description of the homes and kitchens, water supply, food preparation, animals, and personal hygiene and defecation practices.

A series of case studies from the ethnographic observations are presented, giving detailed context information and descriptions of the thought processes and behaviors that were observed. The cases are used to illuminate different points about the differences between the countrypeoples' and the medical community's perceptions.

The combined quantitative and qualitative data are examined from the perspective of designing and delivering health-related information with the intent of changing behavior. The tension between using the folk concepts to maximize acceptability versus using the cosmopolitan concepts to ensure accuracy of knowledge is explored. Recommendations are made for designing mass media messages that strike an appropriate balance.

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Chapter 1

INTRODUCTION

1.1 Background

This is a report of a process evaluation done as a component of the evaluation of the Mass Media and Health Practices Project in Honduras. The project was an undertaking of the Ministry of Public Health, with technical assistance from the Academy for Educational Development. It was known in Honduras as the Proyecto de Comunicacion Masiva Aplicada a la Salud Infantil (PROCOMSI). The project and the evaluation were funded by the Office of Educati n and the Office of Health of the Bureau for Science and Technology, United States Agency for International Development (USAID), with additional support from the USAID Mission in Honduras and the Ministry of Public Health. The evaluation was performed by the Institute for Communication Research and the Food Research Institute of Stanford University and by Applied Communication Technology.

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The PROCOMSI intervention used an integrated program of radio, print

materials, and health worker training to teach or reinforce changes in a variety of skills and beliefs surrounding infant and childhood diarrhea. A method for using these media, with proper testing and program modification procedures was institutionalized in the Ministry of Health for broader use in health education efforts.

The methods represent innovations in several respects:

- Extensive use of research for planning;

- Adoption of a social marketing perspective;

- Intensive use of pretesting and formative evaluation in message and project design;

- Use of an integrated campaign format through multiple media channels;

- Concern for behavior change in project design and implementation; and

- Concentration on a very focused set of objectives.

One component of this campaign was the Litrosol "envelope". The envelope accompanied the Litrosol packet and explained its mixing and administration, encouraged continued breastfeeding and feeding during the episode. In addition, radio spots mentioned Litrosol in jingles that introduced the spot and in most radio spots as well. Finally, posters and flags identified the source of Litrosol and reinforced campaign messages.

A number of research techniques are being used to evaluate the program. For its survey component Stanford is using a "process model" for evaluating a range of complex outcomes. The process model describes a

sequential series of steps that must take place in order for the campaign to have an effect on health status. The model is designed to monitor the process of change over time and to link specific intervention activities with changes in individuals. The variables implicit in the process model were divided into four general categories:

Treatment variables - - those related to the project activity and the messages themselves.

Cognitive and attitudinal variables - - those relating to voluntary exposure to learning of and acceptance of campaign content.

Behavioral outcomes - - those relating to changes in the practices in the target audience.

Health status outcomes - - variables relating to the actual health of children in the target audience.

Specific variables were chosen within each category and measurement techniques were developed. At the most general level, the variables include: exposure to intervention components; behaviors related to management of diarrheal disease, child nutrition and feeding practices, water supply, sanitation, food preparation, personal hygiene; and nutritional status, morbidity and mortality. There are separate studies covering: health care worker knowledge and attitudes; this ethnography; case observations of treatment of episodes; and evaluation of the implementation process. Variables are measured in a variety of ways, including interviews, questionnaires, direct observation, physical measurement, use of archives, and ethnographic techniques. To the extent possible, more than one technique is used to measure each variable, in order to exclude problems of

measurement bias resulting from measurement techniques. The design for the survey component entails a sample of 750 to 800 families distributed over 20 communities in each country. Each family is visited monthly over a period of two years by a fieldworker who asks survey questions, makes observations and/or measures the children. Initial findings point to high levels of exposure to campaign components, learning of the new information, and trial of the advocated behaviors. The executive summary of the report of the major findings is included here as Appendix A.

The design also included an ethnographic investigation in two communities in rural Honduras. This report discusses the framework for the ethnographic study of the PROCOMSI project, presents case materials and summarizes findings. Its goals are to:

- describe the research methodology;

- describe the social context of program action;

- and describe the health context of program action.

1.2 The Goal of This Report

This report uses a general ethnographic approach to illuminate the process of the MMHP project. It discusses at length the context for the program local beliefs about diarrhea and provides case history material. Although it can be read from cover to cover, it should not be. The reader should identify from the table of contents sections of interest and read those. For example, a reader curious about the house variables used in measuring wealth in the MMHP longitudinal survey may wish to read the case history materials.

1.3 Ethnographic Investigation

Ethnographic investigation is based on fieldwork of extended duration *in situ* conducted in the languages of the population being studied. Its goal is to come to an understanding of the daily life of a population and the significant events at regional, national and even international levels which may affect that life. Categorical systems of belief and knowledge, social arrangements, patterns of interaction, household and market economics, and interaction with the local environment are common foci of research. Ethnographic research may be described as context-based, as opposed to context-free research, and because of the innumerable components of this context and the difficulty of quantifying many of these components, is often qualitative in nature. A comparison of qualitative and quantitative research paradigms is given in Figure 1.

Research is often conducted in foreign locales and in marginal rural and urban areas. The context of rural locales, in turn, shapes the techniques of investigation.

Since ethnographic investigation is so concerned with context, or with the richness and variety of facts that can be brought to bear on a problem, it is mandatory that development of substantive models of the research area precede and be developed through research. The next section discusses how the research area of ill health is currently conceptualized in anthropology.

1.4 Medical Anthropology

Medical anthropology commonly makes a distinction between illness and disease. "Disease" is taken to be a clinically characterizable component of ill health and even those perceived subclinical conditions that detract from

Figure 1

Qualitative and Quantitative Paradigms for Research

QUALITATIVE PARADIGM FOR RESEARCH	QUANTITATIVE PARADIGM FOR RESEARCH
Model for research is:	Model for research is:
Context-bound	Context-free
Holistic or concerned with many variables	Concerned with a few variables
Concern for validity	Concern for reliability
Results not often generalizable to larger population	Results often generaliable to larger population
Person as subject	Person as object
Metaphor of "relation"	Metaphor of "cause"
Synchronic	Diachronic
Paradigmatic	Syntagmatic

full health. "Illness", on the other hand, is the perceived and lived component of ill health from the perspective of the patient and his community.

Distinctions between folk, traditional, and cosmopolitan medical systems are made in medical anthropology. Folk medicine is a layperson's medicine: those diagnostic, curative and preventive skills known in general (but to a varying degree) to a community. Folk medicine lay health personnel are often recruited to health roles through family members, or by supernatural intercession, not through an achieved transition. Traditional medicine is elaborated, often literate medicine practiced by specialists. The term "traditional" is utilized to describe Ayurvedic or Unani medical systems which train and license physicians in alternative literate medical systems. In Honduras, traditional humoral medicine is not highly elaborated, but spiritualists and homeopathic physicians come closest to membership in this category. Finally, cosmopolitan medicine describes contemporary international medical practice. "Cosmopolitan" is used to avoid the value laden implications of "modern" or "scientific" medicine.

Medical anthropology starts, then, with the assumption that an illness episode is culturally constructed. Not only do patient's perceptions of their symptoms and significance depend on ways in which their culture categorizes ill health, but their resort to care aims to provide theoretical as well as pragmatic efficacy. This efficacy is found not only in the treatment and its outcome, but also in its diagnosis and explanation. These factors affect patterns of health-seeking behavior, as the material collected in this report will demonstrate.

1.5 Prologue: A Case

The qualitative differences in the experience of diarrhea between contemporary cosmopolitan medicine and medicine in rural Honduras can best be presented with an example.

Maria, the two year old child of Regina, one of three children under five in Regina's household, has been complaining of a painful belly and has been soiling her dress for two days. Regina has withheld beans and other rich foods for a day, but Maria's diarrhea continues. The next time Maria defecates Regina goes out to inspect her stool and discovers that it is very light in color and contains lumps of colored material. Regina immediately administers two tablets of bismuto (bismuth sulfate) and an envelope of terramicina (tetracycline) but Maria continue to lose her appetite and becomes listless. Checking for fever and discovering none, Reginal requests permission from her husband to take Maria to the health clinic in Yuscaran.

Early next morning she leaves for town, an hour and a half away, carrying Maria. Her husband, Jorge, and her sister will stay with her other children. She arrives in town at 7 o'clock, in time to sign up for one of the twenty consultations that the auxiliary nurse will give. After waiting for several hours she finally manages to see the nurse. She explains the symptoms to the nurse and offers a possible diagnosis of empacho, but the nurse says that empacho doesn't exist and this is nothing more than simple diarrhea. She offers Regina kaolin for her child's diarrhea (here, thinks Regina, the nurse substitutes symptom for cause) that is to be poured from a large container in the dispensary if only Regina can come up with her own bottle. Leaving the house so early, however, Regina forgot her bottle, and now has to buy one. While she's in the store getting her bottle she decides to pick up a few extra envelopes of terramicina. She returns to the clinic,

collects her medicine, pays a one lempira (U.S. $0.50) fee and leaves the clinic.

Maria, however, seems to be worse. She drank nothing on the walk to the clinic and does feel hot. Regina decides that a walk home at midday with her sick child is too dangerous, and decides to stay in town. An aunt has a house in Yuscaran, and Regina goes there to lay the child down. She goes off to find Dona Ofelia, a sobadora, or masseuse, a well known curer in town. Dona Ofelia attempts to diagnose the cause of the diarrhea, but is unsuccessful. The child has only had diarrhea for four days and the symptoms for diagnosis are not clearly advanced. She passes an egg over the child's body, breaks it into a dish of water, and places two leaves of a plant called ruda over the egg in the shape of a cross. She will wait a day to read the egg, but meanwhile Regina has administered the nurse's kaolin as well as a purgative of castor oil, cooking oil and almond extract that Dona Ofelia recommends. Maria passes a fitful night with many bowel movements and a fine sweat.

Next morning the child appears weaker, although the diarrhea has abated somewhat. Regina considered the hospital in Tegucigalpa, but the nurse had told her the diarrhea was not that serious and she is anxious to return to her family. Later that morning Dona Ofelia comes to call. She reads the egg in consultation with Regina and her aunt, and all three women decide the child is suffering from ojo. Regina thinks back over the past several days and decides only her sister could have produced it. Dona Ofelia recommends that she return home as soon as possible, but prepares Maria for treatment. She brings more ruda and a bottle of cane liquor. Filling her mouth with the cane liquor she sprays Maria with the alcohol and massages her with the ruda. Completing the alcohol bath, Regina wraps Maria in a blanket, pays

Dona Ofelia 2.50 lempiras (U.S. $1.25) and another 2.50 lempiras for supplies, pays her aunt for food and lodging, and walks back to her village.

Since the diarrhea has been diagnosed as ojo, she no longer administers purgatives. Reaching home she confronts her sister with the diagnosis. Her sister immediately picks up the child and hugs her. During the rest of the day, Maria's diarrhea is monitored, and she is fed very little, but no further medicines are administered, and no further purgatives. Maria's appetite begins to return, and the adults in the household are relieved. Regina's sister expressed surprise that she was identified as the cause of this episode of ojo. Regina feels both the diagnosis and the attribution were correct because Maria improved after her sister's action.

Maria has now had diarrhea for five days, and by the evening of the fifth day she is beginning to ask for water and food. Her parents and aunt cautiously feed her, and are delighted by her ravenous appetite and the fact that she throws nothing up. Very little is fed her, or will be fed her for a week, but all feel that the crisis is over. The crisis, of course, is the danger that the diarrhea would turn into a life-threatening disease.

1.6 Explanatory Models

The case presents examples of the decision-frame used by these rural Hondurans to diagnose and treat diarrhea. This frame is distinct from a cosmopolitan physician's frame, and this distinctive context constitutes the subject of this report. This frame, and the exigetical activity that patients and healers engage in is called an explanatory model. This explanatory model constitutes one of the approaches medical anthropology has adopted to understand the context of illness.

"Explanatory models are the notions about an episode of sickness and its treatment that are employed by all those engaged in the clinical process. The interaction between the explanatory models of patients and explanatory models of practitioners is a central component of health care. The study of practitioner explanatory models tells us something about how practitioners understand and treat sickness. The study of patient and family explanatory models tells us how sufferers make sense of given episodes of illness, and how they choose and evaluate particular treatments. The study of the interaction between practitioner explanatory models and patient explanatory models offers a more precise analysis of problems in clinical communication. Most importantly, investigating explanatory models in relation to the sectors and subsectors of health care systems discloses one of the chief mechanisms by which cultural and social structural context affects patient-practitioner and other health care relationships." (Kleinman, 1980, p. 105).

Kleinman differentiates explanatory models from beliefs about sickness and health which he attributes to the health ideology of each sector:

"Explanatory models, even though they draw upon these belief systems, are marshalled in response to particular illness episodes. They are formed and employed to cope with a specific health problem, and consequently they need to be analyzed in that concrete setting." (Kleinman, p. 106).

Explanatory models are not easily elicited:

"An explanatory model is partly conscious and partly outside of awareness. It is based on a cognitive system that directs reasoning along certain lines. Since explanatory models involve tacit knowledge, they are not coherent and unambiguous. In responding to an illness episode, individuals strain to integrate views in part idiosyncratic and in part acquired from the health ideology of the popular culture. Hence, it is characteristic of explanatory models that they undergo change fairly frequently. Popular explanatory models often use symbols whose referents the individual may not be aware of and whose treatment options he may not fully understand. The "diffused" nature of popular medical knowledge contrasts to the "institutionalized" nature of professional and specialized folk medical knowledge. For this reason popular explanatory models are rarely invalidated by experience." (Kleinman, page 109).

Much of what goes under the rubric of knowledge in knowledge-attitudes-practices studies of health beliefs reflect both health ideology and popular explanatory models, as defined by Kleinman, while much of what is recorded as self-report of practices reflects patient's explanatory models. This makes interpretation of survey items difficult. Explanatory models are developed by the researcher with information collected about cases and episodes of real illness collected usually at home, in response to open-ended questions about illness.

Before the explanatory models I propose here can be used, the context must be set for action. Neither program choices, such as packet size, or message content, nor program outcomes can be understood without setting the framework of ill health in rural Honduras. The next sections deal with the national, cultural, local ecological, social and domestic contexts of program action.

Chapter 2

THE NATIONAL PROGRAM CONTEXT

2.1 The National Problem in Honduras

Honduras' Plan Nacional de Desarrollo: Plan Nacional de Salud 1979-1983 (National Development Plan: National Health Plan 1979-1983, referred to here as the PNS) notes the lamentable health conditions found in Honduras, especial in rural Honduras. Citing the Encuesta Demografica Nacional de Honduras (EDENH) 1972 (Honduran National Demographic Census), the PNS notes that Honduras has the third highest crude mortality rate (14.2/1000) and the third highest infant mortality rate (117.0/1000) live births) in Latin America and the Caribbean. These figures are even higher if only rural Honduras is considered (16.5/1000 and 127.2/1000 live births respectively). The Diarrhea Control Working Group estimates that infant mortality is as high as 138/1000 live births for rural Honduras. These rates are based on a census conducted in 1972 and are, of course, of unknown relevance for describing current conditions. Current Honduran Ministry of Health and Government Census Bureau data show a declining trend in these statistics, but these data are based only on fixed health facility reporting. The percentage of births covered, for example by this reporting probably does not exceed fifty percent. The most reasonable conclusion is that these health indicators are probably improving in Honduras, but are still quite high by international standards.

These rates are the highest in Central America, and are, for the most part, due to infectious disease which could be prevented through improvements in environmental sanitation, vaccination and health education.

Diarrhea and accompanying dehydration is the single largest known cause of death for all ages (12.4% in 1972, 12.2% in 1974, Direccion General de Estadisticas y Censos). In 1977, for example, diarrheal disease was attributed as cause in 1030 infant deaths (in all Honduras). This constituted 24.4% of the 4227 recorded infant deaths. Diarrhea is, as well, the most reported disease. The 110,393 cases of diarrhea recorded in the Ministry of Health, Honduras (MOH) Division of Biostatistics in 1978 signifies a prevalence of 3,210.6/100,000 persons. Adjusted for children less than five years of age who account for 19.2% of the population, but account for 85% of the cases of diarrhea, this rate translates to 1419 reported cases of diarrhea/10,000 children less than five years of age. In addition, because of the explosive rate of population growth (estimated to be 3.5% crude growth rate) the cohort at risk for diarrheal disease grows steadily, overloading facilities.

2.2 Ministry of Health Solutions

In recognition of this problem Honduras has pursued a policy of encouraging village-level participation in Ministry of Health programs. As the USAID Project Paper for Honduras' Health Sector Planning (Project No. 522-0148) points out:

> "In 1973 the Ministry of Health initiated implementation of a policy of extension of coverage of health care and sanitation programs into the rural areas. The program is based on a regionalized system of levels of care ranging from community volunteers, through auxiliary nurse dispensaries, to national hospitals. The overall policy of extension of coverage

corresponds to the model of using integrated rural health services to reach the poor majority. This model is explicitly favored by AID's legislation. Thus, in the analyses to be conducted, less attention needs to be given to GOH health policy than would be required if the MOH had not already adopted an appropriate health delivery strategy." (1979:3-4).

The MOH has developed a system of institutional and geographical levels for referrals of health problems from the community to the national hospital. Five levels of cosmopolitan or institutional health care exist. At the apex stand the six national hospitals, responsible for physician training, the performance of especially difficult procedures, and care of the chronically and mentally ill. At the next lowest level are the regional hospitals, medium-sized hospitals where most patients are treated; next are area hospitals, previously emergency hospitals of about 50 beds. Below this level are the municipal health services. These are the CESAMO, or Centro de Salud Medico (Physician-staffed health center) and the CESAR, Centro de Salud Auxiliar, (Auxiliary nurse-staffed center). This level coordinates community participation in health programs and refers patients to the level of health facility appropriate for their care. At the community level, a number of personnel coordinate MOH programs. Based in the CESAMO and CESAR are rural health promoters, responsible for the most part, for water and sanitation projects. The CESAR is staffed by an auxiliary nurse, who receives eleven months of instruction. In each rural village (aldea) a health guardian provides simple home-based care and a health representative coordinates community construction activities. The guardian is envisioned as the village-level counterpart of the auxiliary nurse, and MOH personnel have emphasized the selection of women. The representative is the

counterpart of the Health Promoter and men are preferred. Neither the guardian nor the representative are paid employees of the MOH; they are volunteers elected by their communities for participation. In addition, midwives have been trained by the MOH to provide birthing services in many communities.

But the difficulties the MOH has faced in Honduras are outlined in the Health Sector Project paper as well. Table 1 outlines the numbers of health care facilities of different levels. Currently, the MOH has 465 centers, including 19 hospitals, and salaried staff of 8199. The number of hospitals exceed the optimistic goals set for 1983 by the PNS for national and regional hospitals, and the MOH is well on the way to fulfilling goals for CESAMOs and CESARs. Table 2 gives the personnel resources required to operate the health care system.

The cost of these services is, however, very high. Fully 99.8% of the total ministry health budget is to be spent on fixed facility programs. This is projected, for fiscal year 1983, to be a total of 45,871,300 lempiras. This figure is only the cost of running these facilities, not the capital costs associated with construction, overhead, and debt service.

Furthermore, 29,480,400 lempiras, or 62.8% of the total projected 1983 budget is to be spent in expensive hospital care. Hospital care costs five times per patient what CESAR care costs (not including capital expenditure) and costs 27 times what village health worker care costs.

The projections above are made even though a sophisticated program of community-based care using village health workers is anticipated. As was mentioned previously, the goals for construction of CESAR's, CESAMO's, and hospitals are being met. What is not now currently being met are the goals for village volunteer health workers. Although the data are not completely

Table 1

Current Honduran Ministry of Health Facilities

Facility	Number
National hospitals	5
Regional hospitals	6
CESAMOs	95
CESARs	433

Table 2

Ministry of Health Personnel

Salaried Staff	No.	Active Volunteer Staff*	No.
Physicians	812	Midwives	503
Nurses	338	Guardians	296
Auxiliary Nurses	2708	Representatives	251
Technicians	900	TOTAL	1050
Health Inspectors	336		
Health Promotors	196		
Administrative Staff	2909		
TOTAL	8199		

*Unidad de Investigacion y Desarrollo Administrativo, June 1981.

reliable, Table 3 shows there are very few village health workers and they fall far short of reaching the 1983 village health worker goals. These figures are even more alarming when it is realized that the national goals for village health worker training were raised in 1978 to 5,000 guardians

One of the reasons for this is outlined in the Project Paper Health Sector I:

> "Experience has shown that there is in fact a high drop-out rate among the VHW's. Moreover, it appears that this rate is lower among midwives who are paid for their services by the community. Nevertheless, it is not clear that this is entirely the result of the lack of salaries ... the health guardians were promised support in the form of supplies which have not materialized ... they expect recognition from the community itself, and from doctors and nurses (whom the VHW's see as their colleagues). Secondly, they expect the MOH to provide further training and supplies needed for them to function." (1980:48-49).

The Project Paper for Health Sector Planning notes:

> "In recent years the GOH's attempts to improve the quality and coverage of services have left the MOH overextended. It lacks resources for basic supplies, supervision, transportation, and many other necessary elements. This situation will be aggravated in the next few years as hospital and clinic construction programs are finished and these facilities begin to compete for scarce operational resources." (1979:5).

Table 3

Village Health Workers - - 1969-1981

Type	Ever Trained	Attend Meetings	Present required reports
Midwives	5433	2085	1295
Guardians	3191	903	548

Furthermore these facilities are estimated to provide reasonable coverage to only 55 percent of the Honduran rural population. It is clear then, from a standpoint of coverage and cost, why the PROCOMSI program is important.

2.3 Other Cosmopolitan Health Resources

In addition to the Ministry of Health staff listed here, health services are available from a number of different sources. For urban dwellers a hospital and clinic-based treatment program based on employee and employer contributions (I.H.S.S.) is available. This is not a significant source of health care for rural Hondurans.

Pharmacies are widespread in urban areas as well and in Danli, one city in our pilot region. Pharmacists may receive formal training at the Bachelor of Science level, and this is quite common now in Tegucigalpa. Danli has a number of pharmacies owned and run by unlicensed personnel. Pharmacists not only fill prescriptions but diagnose and prescribe themselves. Rural countrypeople blur the distinction between physicians and pharmacists and call pharmacists "doctor" as well. A study of use and preferences of health services demonstrated that pharmacies were widely used but considered expensive. Both the pharmacist and the counter staff of family and untrained assistants often prescribe a large number of expensive and exotic drugs.

In the countryside, full-time pharmacies are not found. Small stores (pulperias) carry a range of medicines, from herbals and patent remedies to antibiotics, amebicides and vermicides. Drug distribution companies promote certain drugs in well-developed areas, such as Danli, but it is rare to

find distributors actively working in Sabanagrande and Yuscaran. Instead, shop owners purchase the drugs they sell from pharmacies in Tegucigalpa.

Most medicines used in common illness are available over-the-counter and are widely used, with or without advice, by all Hondurans. "Medicines" are incorporated in many therapeutic regimens, both traditional and cosmopolitan and their use does not proscribe participation in any particular health system.

In an effort to slow self-prescription, and in response to criticism from medical authorities, the pharmaceutical companies have removed the informative fliers and dosing information from drugs. This practice may heighten the risk of misuse.

Naturally Litrosol, with its packet of descriptive information was welcomed into the rural environment. The vendors of other drugs often discussed dosage and contraindications with the purchaser, of course, but since third parties often purchase and deliver drugs to families as a favor, this information was often garbled in transit. Again, the Litrosol packet was distinctive.

Chapter 3

THE LOCAL CONTEXT

3.1 The Traditional Health System in Honduras

Commonly, a distinction is made between folk, traditional and cosmopolitan medical systems. Classification of medical practices as folk or traditional is accomplished less by content than by mode of discovery. Working in a small community, health practices become part of the local explanatory model. However, many of these explanatory models partake of archaic regional systems. This is the case in Honduras. The foundation of many beliefs is humoral physiopathology or humoral medicine, which can be traced from Aristotle through Galen, through Arabic Unani medicine to Spain, and from there to the New World. Humors, essential components of the body are based on four elements: earth, air, fire, and water, thought to be the essential components of matter. The four elements can be arranged in a two-by-two table to demonstrate their essential properties of relative moistness and relative heat. The four humours that constitute the body share these properties, as do all material objects. Figures 2 and 3 present these characteristics of the four humors.

Local conditions such as temperature or dampness give to each person a specific preponderance of a single humour, which accounts for their personalities, thus personalities that are sanguine, phlegmatic, choleric or melancholic. Activity, such as work, or a fit of anger, can upset this natural imbalance, accounting for a number of illnesses and behaviors. The system incorporates, then, a much broader range of phenomena and explanations than is currently found in cosmopolitan medicine. The symmetry

Figure 2

Properties of Humoural Elements

	HOT	COLD
MOIST	Fire	Water
DRY	Air	Earth

Figure 3

The Four Humors

	HOT	COLD
MOIST	Blood	Mucus
DRY	Yellow bile	Black bile

applies as well to foods that are eaten, the properties of diseases, and the properties of medicine that are used to cure a disease. In general, the goal of therapy is to maintain a dynamic homeostasis through the administration of medicines or therapies such as massage which return the body's normal balance. The theory's apparent validity is demonstrated historically and it is not easily displaced. This humoral system was once promoted by physicians, but since the acceptance of the current cosmopolitan medical paradigm, few health experts elaborate this traditional medical system, and thus a wide range of beliefs about this system is found in different communities.

The current ubiquity of the traditional paradigm is demonstrated in the way medicines are used. Rural Hondurans are especially wary of the interaction of drugs and foods, perhaps because patients use a wide range of medicinals inappropriately. One precaution is the fasting diet (ayuno) applied to therapeutic regimens. This is often used after injections, but more frequently for drugs taken orally. This is true as well for Litrosol. Countrypeople feel that the gut has to be prepared for a medicine and that the medicine works more effectively in the body if the patient fasts. This fast (ayuno) is part of the healing regimen (la dieta) which is applied to all episodes of illness.

Order or sequence of treatment is likewise a preoccupation of the folk medical system that is applied to cosmopolitan therapy. Since illness is thought to be a result of an imbalance in a dynamic body system, the restoration of balance involves less the destruction or neutralization of an invasive agent, than stepping the body through a series of changes. Diet, then a series of treatment steps, then slow recuperation are norms of this therapeutic regimen that underlie the incorporation of oral therapy.

Unfortunately, the compensatory feeding model promoted with oral therapy programs is not well accepted in this explanatory model, although the dynamic restoration of the gut and the body from dehydration is easily accepted.

3.2 The Folk Medical Healers in Honduras

The folk medical system, like the folk society from which its title is borrowed, exists omnipresent in rural and poor urban environments in Latin America. Its tenets of belief are often poorly articulated and its roles and statuses little differentiated in comparison to cosmopolitan roles.

3.2.1 Healers

Literature on folk healers (curanderos, midwives, etc.) often treat these occupation statuses as full-time professional occupations. But, rarely are folk medical occupations practiced full-time, and rarely are they accorded professional status. Rather, they are often perceived as skills, which may be conjoined in different ways in different people. Some of these skills are midwifery, injections, massage, herbal medicines, bone-setting and sorcery. Different titles are often accorded these skills - thus rural countrypeople may talk about:

parteras (midwives)

curanderas (curers)

injectadoras (injectors)

brujas (witches)

sobadoras (masseuses)

But often they will talk about "someone who knows how to cure . . . " or "someone who helps with delivery" (alguien que ayuda con los partos), or the intelligent one (inteligente). In the case of parteras this circumlocution serves a double benefit: On the one hand, the Ministry of Health has had a midwife training program that all midwives were to participate in (now called "parteras adiestradas" - trained midwives). Communities do not like to identify for the Ministry of Health those community members who provide these essential services and did not participate in the midwife training program, for fear they might be impeded from practicing there. On the other hand, the practical skills associated with birthing, or bone-setting are not highly valued in the rural Honduran folk health system, and individual midwives, male or female, attempt to gain status by mastering a number of other skills, including witchcraft so that some midwives do not admit their status. The construction then, of these folk health roles is unlike the construction of a professional cosmopolitan medical role:

- They are rarely full-time
- Skills are widely distributed and barely uniform across actors in a given role
- Individual practitioners put together an idiosyncratic collection of skills
- These skills and knowledge are well-known to the lay public

Folk practitioner health occupations, then, rarely mimic the professional occupational structure of cosmopolitan medicine. This has been one downfall of many programs that have attempted to integrate folk healers into cosmopolitan health services. The PROCOMSI promotion used one folk healer, "Dona Chela", a midwife, in their promotion. It was interesting to note the low credibility in the midwife character "Dona Chela" in the radio campaign component of the MMHP program. When questioned, Los Dolores residents replied that Dr. Salustiano, the Ministry of Health figure, made up her lines.

3.2.2 Beliefs

Lay knowledge of humoral medicine is widespread, but hardly uniform. Individual Hondurans know different elements of the folk medical system as they know about cosmopolitan services. However, there is widespread commitment to a hot-cold categorization of nature now known as humoral physiopathology. Although some residents of Los Dolores profess not to "believe" in humoral physiopathology, they act in everyday practice as if they do. Humoral physiopathology is an incompletely expressed folk practitioner explanatory model.

Their beliefs are dynamic, rich, and idiosyncratic. Too often studies list "beliefs" as if they were concrete entities. Instead, this study will present beliefs as part of action and context.

3.3 Social Context

The twenty sites selected for research demonstrate differences in

ecology and economy but share some important features. Although differences were anticipated between urban and rural dwellers with regard to knowledge of cosmopolitan medicine, this was not found. Generally, knowledge of cosmopolitan medicine varied with education and class background. Lack of access to cosmopolitan services may also play a role, but very few PROCOMSI evaluation sites lacked reasonable access.

The two towns in which the most intensive work was conducted were similar in terms of a number of features to the other rural communities in the study. First, some particulars about the two sites:

The communities are organized on the basis of households containing kin, primarily conjugal family units.

Land was controlled through formal, but also informal title in "minifundia" or small-holdings controlled by individual families.

Countrypeople farm staples primarily.

A great number of beliefs about diet, health, and ill-health are shared.

Because ethnography demands a long-term commitment to sites, two communities were selected for intensive investigation.

3.4 Site Description: Two Towns - Agua Fresca and Los Dolores

Agua Fresca and Los Dolores (pseudonyms) are villages in the municipality of Nance (pseudonym). Nance is a mountainous area in the department of El Paraiso, one of the 18 departments of Honduras. The department is part of Health Region I, a health region in the interior

highlands of Honduras that surrounds Tegucigalpa and spreads south and east to encompass some 220,000 people.

The villages of Nance are scattered through the mountainous terrain at altitudes of 1000 to 1600 meters, with several peaks reaching to 1900 meters. The valley floors are some 600 meters below the steep ridges of the mountains of Nance, and countrypeople must often farm plots that slope in excess of 45 degrees. The area has sharply demarcated wet and dry seasons. During winter (invierno) which stretches from May to October, rainfall is commonly 1000 mm. per year, but during the rest of the year the dry summer (verano) boasts of only 1-2 liters/second/kilometer low flow in its rivers and streams.

The soils, vegetation, and climatic conditions of Nance support extensive stand of needleleaf and broadleaf evergreens as well as deciduous scrub and some deciduous trees. Rural people grow corn, beans, sorghum, potatoes, and some rice. Commercial quantities of sugar cane are grown as well, which are often processed in locally made cane mills (trapiches) into the semi-refined sugar bricks known as panela. The conifer forests support resining, and numerous cooperatives are organized in rural villages to tap the trees. Very low quality cattle grazing is practiced in sections of Nance. Throughout the municipio there are only six commercial-scale farms, and the community exports little in the way of agricultural produce to the capital.

The town center is connected to Tegucigalpa by an all-weather dirt road, and lies approximately one and a half hours from the capital. The town center has a telegraph and telephone, as well as a CESAMO. The CESAMO is staffed by a physician, two nurses and a health promotor. One of the nurses is a local healer that has been successfully maintained in the health

center due to community pressure. There are three MOH trained midwives in Nance, as well as one midwife who refused the training, and two injectadores who inject medications brought to them by their clients.

Two major components of rural social organization are party and religious affiliation. Nance is known as a stronghold of the National party, the more conservative of the two major parties in Honduras. Nance is also predominantly Catholic, although there is a Protestant chapel in town.

Eighteen villages are scattered around Nance. Agua Fresca and Los Dolores are each about one and one-half hours walk from Nance. Neither village has a true town center, and houses are scattered close to fields throughout the extensive terrain of both villages. Both villages are fairly mountainous with little bottom land, but most agriculture is confined to this bottom land. Farmers grow corn and beans and harvest sugar cane. A few farmers have coffee trees and small orchards. Geographic centers of the two communities are approximately five miles apart, and the communities share a number of characteristics. The geographic propinquity guarantees similarities of soil types, terrain and rainfall. Countrymen of Los Dolores and Agua Fresca remark on the physical similarity of the two communities.

The agricultural cycle in both towns begins in April of each year when scrub is chopped and burned. Flatlands may be plowed with an ox-powered home-made steel tipped plow. If not, a dibble stick is used to prepare the ground for planting. Farmers wait for the first rain, which by tradition falls on the Feast of San Isidro, May 15, for the planting of their corn, beans, and sorghum. Crops are often planted together, the young stalk of the corn plant serving as support for the bean vine. Beans are harvested early but the corn continues to grow. Young ears are harvested in August, but the bulk of the crop is doubled on the stalk to prevent rotting of the mature

ear and allowed to dry. This field corn is harvested in October and November and stored in corn cribs in the house or adjacent to it. Within the past several years farmers have begun to use fertilizers provided by the Development Bank (BANADESA) on their crops, although farmers now complain that their plants seem more susceptible to disease because of it.

The agricultural cycle varies little between the two communities in basic crops. Agua Fresca, however, has an active resin cooperative that taps trees and provides cash income for a number of families. The equipment for resining is provided by state-supported agencies and the cooperative and its officials received training in the operation of rural cooperatives. The resin is purchased by the state as well. Los Dolores at one time supported resining and several families in Los Dolores still resin in nearby communities, but the resining was conducted on an individual basis and failed to incorporate the community as a whole.

3.5 The Social System

The population of all 20 sites can be characterized as Mestizo or Ladino. Mestizo or Ladino social organization has not been the subject of significant anthropological inquiry. Anthropologists and sociologists have concentrated for the most part on indigenous cultures, even in Honduras, where such groups constitute only 10% of the entire population. Discussions of Mestizo and Ladino social organization in Mexico, Guatemala, and the rest of Central America would not seem pertinent to this inquiry but for the fact that the special organization that characterizes much of Honduras is part of this broader culture area. Research in this culture area has generated analytical perspectives which have had great impact on comparative peasant

sociology. The folk society (Redfield, 1947), one of these perspectives, characterized small, relatively isolated community that could be studied in isolation. This research demanded a thorough knowledge of many institutions in the community and long term fieldwork was necessary to conduct it. But since the middle of this century the region has undergone changes at the national and regional level that has undermined the physical isolation of the village and the utility of the community perspective. The work of Lewis on the culture of poverty (Lewis, 1959, 1966) redefined this small community as a marginalized and exploited component of the larger society. This perspective led to a rethinking of the model of the folk society that Redfield proposed and rural people were increasingly perceived as independent of their community. Wolf, finally, attempted to link these two arguments with his notion of open and closed corporated societies, which defined both "kinds" of community in the larger regional or national context (Wolf, 1955). Closed communities are traditional "ideal" rural sites. Individuals in the community who share similar housing, equipment and other features are under impressive social control, and generally maintain social cohesiveness at the expense of individual advancement. Ostentation is subject to great social censure, magical causes of illness abound, and explanation of disease is used as a weapon of social control. In open communities violence abounds, individual advancement is the goal of activity and social cohesion is minimal.

Finally, the most recent perspective applied to rural Ladino life is that of "loose structure." The argument is best presented in Gudeman (1976). Rural people seem to live in a "rule-free" environment. Marriages seem transient, many "illegitimate" children are born, inheritance is contested, individual disputes are resolved through violence, and voluntary

organizations appear to form and dissolve rapidly.

In fact, no one of these arguments characterizes the villages of this study. The communities, although based on a core of consanguineous kin, do accept and sell land to outsiders. Country people travel frequently to town centers and the national capital to conduct business, and many parents have children who work in Tegucigalpa. Most households have radios, and each town has a battery powered television. The possibilities of high geographical mobility and the pressures induced by the high birth rate guarantee that many parents and many children look for opportunities and health care outside their village. Although it would be a serious error to imagine that these characteristics invalidate the methodological approach of structural-functionalism found in community studies, they do call into question the utility of information about single villages isolated from their national and regional context. The significance of the choice of perspective for health care systems is large. The conceptualization of the "community" and issues of equity that underlie primary health care are elements of current program planning that need to be reconciled with the social, economic and class conflicts that characterize many areas of the developing world.* Given these caveats, a description of the two sites for ethnographic research, now follows.

The two aldeas of rural Nance are scattered villages without a true town center. Houses are organized into clusters or hamlets (caserios). Each homestead or premises consists of a single house and auxiliary outbuildings. The homestead is defined by the presence of a hearth. Buildings are

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*This is one of the reasons that this evaluation describes a household-based diarrheal disease control program and not a hospital based program. Too often researchers do not question what can be delivered given social, political and economic constraints in comparing program impact.

sometimes erected in fields to house farmers protecting their crops from animals, but these temporary constructions will not have an adobe fogon or stove that is found in all houses in the two villages.

The households of these villages are in both a normal and a normative sense conjugal family units. The husband, wife and unmarried offspring occupy a single house. This is the household formed by the marriage of offspring and the one that grows and develops briefly into several other forms. Household forms may be characterized using the typology shown in Table 4.

The conjugal family household is a form of single family household and is the household form found most commonly in these two communities, as it is in Central America in general. Households that may be classified as Type 3 households include those that contain a married couple or single person with children, and single widows or widowers with unmarried children in which the widow or widower is still the head of the family. The preponderance of Type 3 households is reflected in conventional household parameters as well.

Table 5 shows the distribution of household types in one community. The negative kurtosis is due to the flatness of the curve. In fact the data are trimodal, with peaks at household sizes of 3, 5, and 6. These descriptive statistics do a poor job of describing rural household organization. The household types described above do a far better job. The predominance of Type 3 households reflects a preference for neolocal residence that has been noted by many authorities (cf. Adams, 1956; Hunt and Nash, 1967). This residence pattern may be established at marriage, if a formal marriage takes place, or at the birth of a child to the couple.

Construction of a separate house and provision of an independent hearth constitutes the final solemnization of a marriage. Prior to this the

Table 4

Laslett-Hammel Types of Households

Type 1	Solitaries
Type 2	No family
Type 3	Single family households
Type 4	Extended family households
Type 5	Multiple family households

Table 5

Household Types in Los Dolores

Type	Number and Proportion	
1	3	0.095
2	0	
3	25	0.595
4	10	0.238
5	3	0.0714

husband and wife are a satellite household within, usually, the husband's father's house.

Partition marks the beginning for the new couple of a domestic cycle. Changes within the household unit from the moment of inception are predicated on a number of factors, not least of which are the chronological and physiological attributes of the household head. Couples begin their domestic life as Type 3 households, and go through a period of household growth by adding children. As children become more mature, or as the household proves successful in accruing resources from the labor of its members it will pass through periods as a Type 4 or Type 5 household. The most common form of Type 5 household is that of a junior, recently married child and spouse temporarily lodging in the house of his or her parent. The household will bud off this new household to begin a period of decline in the natal household. Finally the aged parents will choose to live with fostered grandchildren or adopted children or finally in solitary dependent households. A demonstration of this hypothesis can be found in Table 6, where the average age of household head by type is shown.

The table shows how average age of household head rises as the more complicated or extended forms of household organization are found. This is due both to biological considerations of the age of household members and the increased resources that the household can control. The advantages of this approach for descriptions of household organization is that of a mechanical model as opposed to a statistical one. The operation of the household system can be pictured from the level of the inhabitants, and the various factors which on household decisions are based can be visualized.

The characteristics of the non-random sample of households used in Agua Fresca are shown in Tables 7 and 8.

Table 6

Household Parameters
in Agua Fresca

Mean household size	5.83
Maximum	14.0
Minimum	1.0
Standard deviation	3.29
Kurtosis	-0.41

Table 7

Household Type by Average Age of Household Head
in Agua Fresca

Type	Average Age
1	74.3
3	46.4
4	66.7
5	61.3

Table 8

Description of Sample Population in Agua Fresca

Total number of households		21
Total population		137
Mean household size	6.64 people/household	
Hammel-Laslett Types	**Number**	**Age of Head**
Type 1	0	
Type 2	0	
Type 3	12	39.8
Type 4	6	53.1
Type 5	3	60.3

The data from both communities do not demonstrate the commonly held assertion that the family in Honduras is weak. The "family," defined as those personnel linked in consanguinity, is still the single most important social institution. It was the ideal focus for program promotion.

3.6 The Domestic Context

3.6.1 The Home

The domestic context is the locale for program intervention, and is the setting for the changes in health practices promoted by the program. The implementing team spent research time familiarizing themselves with this setting and used knowledge of this setting to select appropriate interventions. In fact, this knowledge was used more to reject potential interventions than to shape outcomes.

The Honduran homestead consists of a relatively flat housesite, a home, a corn crib, chickens, pigs, horses and mules, a patio and an area to defecate. Conventions and locally available materials define the ideal house: adobe walls, washed with limewater, beams of thick hard resiny wood, roof of curved tile and stout doors.

The house is the center for all activities: feeding, eating, working, playing, entertaining, sleeping and contamination. Work implements are mixed with children's school books, laying boxes for hens, an elevated hearth (fogon) for cooking, a suspended rack for storing seed grain, a box or two for clothes and valuables, and a hammock for guests and sleeping. Hondurans have learned the secret of peasants everywhere, by spending little they live on little, and every product, every plastic bag or bottle that enters the house does multiple service.

The floors are dirt. Those that can afford it have cement floors, but they are few. Dirt is considered warmer and easier to maintain, for spills are soaked up. The dirt is well-packed by use and a new floor can be made by smearing it with mud. Fleas can be controlled by spreading pine needles on it. Cement requires washing, and is porous and rarely smooth. Because floors are built without drains, water that enters from outside on a cement floor has to be mopped up again and again when people spit, water spills or when animals or children urinate or defecate. A dirt floor absorbs these insults. Children's falls on cement are more serious and because the floor is "cold" they need shoes. In short, few people think cement floors are practical.

The preferred building material for walls is adobe. Adobe is made into bricks by packing a mixture of viscous mud, straw and horse or cow manure into a frame, usually about 20 inches long, 10 inches high and 6 inches thick and allowing the block to harden in the sun. The blocks are laid in courses lengthwise with the broad, flat side of the block horizontal to the ground.

Adobe is the preferred building material because of its availability, its superior insulating properties and its defensive qualities - neither bullets nor machete blades easily penetrate it. The blocks are fairly long-lived as well, and rural countrypeople claim that the adobe, if roofed and painted with lime now and then, will survive almost indefinitely. Repairs can be anticipated at only 20 year intervals. Most countrypeople can make adobe and build houses from it, with assistance from carpenters for roofing. Considerable investment of time is needed, however, to produce enough bricks for a house.

Many other materials are used for walls, however, such as cardboard,

banana leaves, quartered timbers, bamboo and planed lumber. Building styles are often mixed, as additions are added to the home. One adobe technique that is very popular is called bajareque. A wattle frame of saplings is built, over which an adobe daub is smeared. Sometimes a three dimensional matrix of wood is built, packed with stones and covered with adobe. All these adobe construction techniques are finished with a lime wash or plaster for rain and damp-proofing.

Preferred roofing material is ceramic tile. The curved tiles are usually locally made by specialized laborers. First the clay is dug and soaked with water. When mixed and ready the clay is forced into a rectangular form on a smooth table and slid onto a wooden shape to give it a characteristic trough shape. The tiles are dried and then low-fired. The availability of tiles, which are relatively rare and by local standards expensive, are often the determinant of house size, for a small house will need at least a thousand tiles for roofing. Tile is not easily transportable, another restriction on its availability.

Other roofing materials include commercially produced laminates, compositions of cement and asbestos, tin and palm fronds and thatch. Although thatch provides some of the insulating characteristics of tile it harbors vermin, leaks, and is a fire hazard.

House styles vary from a single rectangular room, with a door placed in the middle of one of the long walls, to multi-room haciendas with corn cribs and a tack room.

Houses often grow with family size, and a not uncommon first house would be a single room with an attached exterior cooking area constructed of poles and thatch. Families avoid the cooking smoke, water damage and other inconveniences of sharing a single room with a stove, and mothers can

supervise children's play from the area. Ideally, however, the kitchen area is housed in a separate room so that women may avoid the sun's rays and the attention of passersby.

3.6.2. Kitchens

Kitchens consist of a hearth, either a simple three-stone ring on the floor, or an elevated adobe stone. A smooth raised plank serves as a support for a handgrinder, storage pots and dishwashing implements. Dishwashing is done over a trough that carries the water out the door, but the water often spreads over part of the kitchen. Rural people have few cooking implements: a small number of bowls and dishes, which often have to be rinsed during the course of a meal, clay pots for water storage and cooking, a metal comal or fry pan for baking tortillas, a metal coffee pot and cloth coffee strainer, a few wooden spoons and a few woven baskets.

3.6.3 Water

Water is collected from springs, streams, and wells, although Los Dolores inhabitants prefer spring water. Springs and streams are not fenced or protected, and are often found at some distance from houses. A few houses have piped water, using plastic tubing installed by the owners. Piped water may be used for drinking, but sometimes spring water is collected as well. Locally installed water distributions often leak and create puddles along its length and near houses. An occasional house has an old flume systems built from split bamboo.

Traditionally, women carry water in clay water jars, but since these

are heavy and fragile, plastic and tin buckets have been substituted. Some residents of Los Dolores walk for twenty minutes to collect water in the dry season. In some nearby communities, where water is more distant, men transport it in barrels on donkeys. During the wet season Los Dolores inhabitants will often change water sources, opting for convenience.

Water is stored in low fired clay pots often elevated on pronged sticks. A wooden plank or a dipping bowl often partially covers the top. The clay allows evaporation, and cools the stored water, but is difficult to clean. The inside of the pot may be scoured with a clean brush or a bundle of twigs. When the pot begins to leak too much water, the outsides will be coated with a slurry of mud and water.

Little or no purification of water takes place at home. Visible contamination, such as insects, will be removed from the water. The residents of Los Dolores are attached to the flavor of their water and do not like to alter it by, for example, boiling. Discussing contamination of water, Los Dolores residents note that water is collected from a stream that flows over dirt, or in a well where dirt filters water. "Dirt" doesn't necessarily contaminate water. Contaminated water should also taste bad. Inhabitants of Los Dolores know about water sources in town that make one sick. Water can cause illness and diarrhea for conventional cosmopolitan reasons, but country people believe that water drunk at the wrong time can also produce sickness.

3.6.4 Food

Beans and corn form the staple of Honduran diet. Each food is an important source of contamination. Beans are shelled by all family members

including children and soaked, but are then boiled for hours. This soup is eaten over a period of days, often cold or if lard is available, mashed and refried. Mothers believe that bean soup is an ideal food for children, and feed it often. This soup (caldo) is rarely heated, and certainly not to boiling. When asked if they reheat caldo mothers often reply yes, but if probed as to the temperature, they reply to the temperature of breastmilk. As with other liquids including water, if boiling is produced, the soup is brought just to boiling, once or perhaps twice. Boiling for extended periods shrink volumes and consumes firewood, and this food must be extended.

Corn is prepared into tortillas. First the corn is soaked in water and lime or ash. The corn is cooked the next day and ground with a handmill early in the morning to produce a dough (masa). This lime reduces the corn and makes available for digestion long protein chains, but also produces a perfect medium for bacterial growth. The masa is reground, if the tortillas are made properly, on a stone. The masa is kept moist by adding water. The dough is rolled into a ball and then squashed in a wooden press. Women used to pat out the tortillas by hand, proud of their round uniform shape, but now any child can produce them with these tortilla presses. A sheet of saran wrap or wax paper is used and reused on the faces of the press. The tortillas are then baked on a metal comal. These tortillas, unlike those in, for example, Guatemala, are made only once a day and stored. They may be reheated for consumption, but they turn stiff under heat, and so are usually not heated long enough to guarantee their safety.

3.6.5 Animals

Animals are another important source of contamination. Animals are usually allowed access to the interior of the house to fully domesticate them. Also, predators such as opossums and foxes encourage farmers to bring their animals inside at night. Dogs and cats, of course, sleep indoors. Pigs sleep on the patio. Pens are a poor choice for pigs who root up fences, stones and crack cement. There is much contact between children and household and barnyard animals. These animals join the humans in defecating broadcast.

3.7 Defecation and Personal Hygiene

One of the reasons animals are such an important source of contamination is because human defecation is, for the most part, broadcast, or in the language of sanitary engineers, promiscuous. The use of the term "promiscuous" with its denotation of indiscriminate, or casual, is inappropriate, however in the two villages. Defecating occurs in clearly demarcated areas surrounding the house, usually overgrown with shrubs. No food is grown in this area. Defecation, in healthy individuals, occurs at regular times as well, aided by a monotonous diet of grains. The wide use of purgatives and laxatives is linked to this concern for regularity. Defecation is accomplished by squatting. Squatting to defecate, in addition to its physical benefits also guarantees a minimum of skin contact with the stool bolus, and the diet of beans and corn guarantees substantial firmness to the stool. Under these circumstances countrypeople may not clean in the perianal area following defecation. When sick, however, leaves or corncobs or stones are used to clean. Children rarely clean themselves. This is a

crucial area for intervention to improve hygiene, but it is unclear how handwashing can be promoted while defecation takes place so far from sources of water, soap and towels.

Animals, of course, follow humans to these sites, and countrypeople are often forced to carry a stick to drive off starving chickens and pigs. All farm animals, including cows will consume human feces if hungry enough.

Latrines are not the preferred site for defecation. Rural people don't like the smell of pit latrines. Water sealed latrines are well received in other parts of the country but are not found in the this region. Women will occasionally use the latrine for modesty's sake, but children don't. Design problems abound in the pit latrines currently being used in Health Region I. For one, they do not permit squatting.

At night, adults and children use a chamber pot (basinica or nica) a technology rarely discussed in current water and sanitation projects. The chamber pot is stored, only sometimes covered, under the bed, and cleaned and washed the following morning by the woman of the house. Cleaning of baby's bottom is also accomplished with a bare hand, as is the washing of soiled sheets. Very sick children will simply lie in bed and dribble fluid on it. Liquid stools also soak through the cardboard boxes that hold diapers. In the face of the constant demand to clean sheets, blankets, diapers and bottoms, mothers are left with few aids - poor quality soap, cold water and sunlight - and a supportive ideology that maintains that the organisms that produce diarrhea (bichos or worms) , all die upon defecation.

3.8 Handwashing

Handwashing takes many forms, from a woman's formal ceremony of holding and pouring water for a guest, husband or father, to a quick splash of water over the hands from a bowl. Since only cold water is used, soaps, especially commercially available soaps are a problem. Detergents and soaps are used for hand washing, but since they are perfumed their odor would contaminate food or other objects. Soap is also expensive. The most popular soaps are balls of harsh solid detergent or plastic bags of detergent. They rarely work up a lather, but appear to use abrasives to scour off dirt. Bathing of adults is not, for most families, a daily event, and children and adults never bathe when sick, so a number of factors conjoin to boost potential contamination.

In the household then, fecal contamination, from children's clothes, bottoms, and hands is possible. Animals feces transmit a certain number of pathogens, and food handlers transmit others.

Efforts to break this internal chain of contamination usually focus on one or two points in what is described as a chain. Rather than a chain, however, this contamination is better described as a network that radiates from one member to another. The reader must note that any single health behavior change is unlikely to be successful in reducing contact with pathogens. Isolating individual health behaviors is a great strategy for planning interventions but the inadequacy of this strategy is demonstrated by the following example.

A typical kitchen at midmorning might contain a handgrinder filled with wet corn kernels, a plastic tub filled with soaking corn, a plastic tub filled with breakfast dishes and water, a pile of tortilla dough, a pot of beans bubbling on the stove, a coffee pot simmering nearby, a supply of wood

fuel for the stove, drinking water, washing water, a dog, a cat, chickens (one looking for a laying box), a small child, a radio playing softly, and a woman now turning the handle of the corn grinder, now patting tortillas, now immersing her hands in the corn water, now stirring the beans, now tending the child, now shooing the chickens. Gradually, wiping her hands on her apron, order is salvaged from chaos, meals are prepared, children and animals tended, guests and interviewers are offered coffee.

Chapter 4

EXPLANATORY MODEL OF DIARRHEA CAUSE AND TREATMENT

4.1 Etiologies

Four major etiologies are ascribed to diarrhea by rural Honduran informants:

worms (lombrices)

evil eye (ojo)

fallen fontanels (caida de mollera)

indigestion (empacho)

The last three causes are commonly known folk illnesses that may be treated in the home or with a folk healer. The first condition, worms, is considered to be an essential parasitism.

4.2 Worms (Lombrices)

Worms are believed to be a symbiote of the gut and are transmitted in utero to the fetus, according to beliefs in Nance. Most of the 37.1% of the respondents who did not feel they were born with worms expressed certainty that they were passed in breastmilk. These eggs develop in a sack or bolsa in the gut just below the stomach. During the first year of life the worms are underdeveloped and cannot digest dense compact foods. This accounts for the infant's limited diet and the fact that some foods, such as beans, may cause gas and diarrhea. The infant's diet is restricted, and meat and

beans, liquid animal milk and eggs are not regular components of the diet. Should they be begun in the diet, and the "worms" adjust to their presence, they must be continued, or the worms would wander in the body in search of other rich food sources causing diarrhea and other illnesses, such as worm fever. Evidence for wandering is provided by ascarids and pinworms, sometimes visible. If worms are properly and regularly fed, however, this symbiosis is beneficial and necessary for human survival, for if an adult or child should lose his worms, death is certain.

An argument can be made for the plausibility of the vermal theory of digestion (which is not new) from a social and cultural perspective. On the one hand, the interconnectedness of the food cycle is everywhere apparent in the rural farm household. Human feces are consumed by pigs, cows, chickens and other animals. These animals and their products are, in turn, consumed by humans and their manure is used to fertilize fields. That this external food chain should have an internal equivalent is not surprising. These metaphoric extensions are not simply amusing rhetorical tropes, but important elements of the "orderliness" of nature that is felt to have consequences.

On the other hand, different kinds of foods mark important social events, and changes in diet accompany changes in social status and economic circumstances. Meat is the most craved addition to countrypeople's diets, but it is considered a heavy food requiring regular application of medicine to control the growth of worms. The enforced abstinence from meat in the rural diet has its perceived beneficial outcome: consumption of meat and other prestige foods naturally leads to illness.

Worm-caused diarrhea is a measure of growth in children as well, and marks important stages of development. Movements (<u>movimientos</u>) of the body

such as those induced by first crawling, and first steps, or those movements of the gut held to be caused by teething, first words or the full moon all encourage worm activity. Often this diarrhea is considered normal, and parents will usually not treat this diarrhea, at least during the first three days.

Finally, the incorporation of adult foods into the child's diet produces diarrhea, which is explained as worm caused. In fact, this food may be highly contaminated but treatment will be postponed or a purgative administered as treatment. Normally, it is felt that dense foods and culturally defined heavy foods must be avoided during the first year of life; correspondingly, after one year of age vermicides are often regularly administered by parents.

Thus worm etiology of diarrhea is intimately linked to important developmental markers of the child, it accounts for a number of nutritional habits in children and adults, and is linked to the social and cultural dimensions of impoverishment in rural countrypeople. Cosmopolitan medicine contends that a relatively small proportion of diarrheal morbidity is due to worms, but their macroscopic size, shape, and apparently high prevalence in countrypeople, and their role in ethnophysiology make worms a convincing cause of diarrhea.

4.3 Evil Eye (Ojo)

Evil eye, fallen fontanels and indigestion are much less frequently ascribed as cause of diarrhea, but are considered fatal diseases if not treated. Evil eye, or ojo, is a folk illness widely disseminated in the world. Evil eye is the product of envy that attaches, through the mechanism

of vision, to weak infants or baby animals. A red thread or bracelet is tied around the wrist or the child is dressed in an article of red clothing to avoid ojo, and pregnant women often use red underwear to avoid damage to the unborn fetus. Children with ojo demonstrate a number of symptoms: diarrhea and stomach upset, fever, sunken eyes, often red. These symptoms may also accompany moderate to severe dehydration, and it is one of the arguments of this section that the folk etiologies that accompany diarrhea are also closely linked to dehydration. There is, in fact, a link between cosmopolitan medicine and folk medical theory in this area, and countrypeople are responding to empirically observed symptoms.

Evil eye is caused by the envious glance of people defined as strong (sweating men or women, pregnant women and others) and affects, usually, children less than one year old. In each of the cases above the illness defines important social or cultural differences: the hard-working adult versus the dependent infant, or the yet incomplete and dangerous future birth versus the successful product of a woman's labor. Ojo often occurs in joint households and can drive such households into partition. It is therefore a medical expression of the economic and political factors that drive the domestic cycle.

4.4 Fallen Fontantels (Caida de Mollera)

Fallen fontanels are another folk etiology for diarrhea. In the case of caida the relationship of dehydration to this folk illness is clear. Caida affects very young children and is due to parents' neglect. A fall or near fall may precipitate caida. Although ojo and worm attacks are treated with purgatives and may endanger the child, caida is treated manually,

rubbing the fontanels, pushing up with the index finger on the roof of the mouth, sucking on the fontanels, and sometimes turning the child upside-down and slapping the soles of the feet. Again, the folk etiology identifies a parental responsibility, a social responsibility. Since the cause is not an ingested or internal product, and since it involves a physical and external act (dropping) instead of penetrant visual rays, the treatment is suited to the cause.

4.5 Indigestion (Empacho)

Empacho is the folk illness that is most often reported for adults in the two villages, and often affects children. Empacho is an illness accompanied by flatulence, a feeling of fullness, especially on the right side of the abdomen, a peculiar skin quality, and in evacuation a sensation of pushing accompanied by stools broken in short, watery bursts. The cause is digestive: eating too little, eating too much, eating cold foods when hot, hot foods when cold, eating especially heavy foods when hot, skipping a meal, or eating a meal at the wrong time. Empacho concerns the routinization of digestive habits. The cure consists of the administration of a purgative and a massage that terminates on the abdomen.

For the most part, treatment of empacho is based on the ethnophysiology of eating. Indigestion causes a dirtying of the gut. Patients describe the gut as wounded (82.9%) and the goal of treatment is to clean the gut and avoid contamination of the wound by adopting a healing regimen (79.7%). Countrypeople adopt a healing regimen generally in medical treatment. A medicine requires a special diet, and milk, eggs, chicken, beef, pork and beans are prohibited (e.g. 69.8% do not give milk, 63.7% do not give eggs).

The patient should not bathe, get rained on or be exposed to winds. This diet avoids contamination of the intestinal wound and even superficial wounds receive the same regimen to avoid putrescence. The purgative also acts to relieve the body of the wandering worms, which temporarily lowers the body's toleration of "rich" foods. And only medicine can help one get well. Recuperation involves the administration of medicine. Bathing is avoided because it is felt that water will enter the body through pores of the skin and cause bloating. The bloating appears to be the edema that accompanies kwashiorkor-related nutritional disorders, if the regimen is continues for a long enough time, i.e. if the child suffers from a chronic diarrhea a link between this treatment and malnutrition might be imagined; again visible symptoms and causes are substituted for invisible ones.

4.6 Folk Conceptions of Oral Rehydration Therapy

Oral rehydration salts, packaged as Litrosol, were thought to be an effective medicine for a number of complaints. First, the distinction of dehydration and malnutrition, mentioned earlier, was not completely carried over into the folk explanatory model. Most countrypeople assumed that the powder contained vitamins and nutrients, some even thought it contained an antibiotic. Most felt it stopped the diarrheal episode, not the dehydration. Countrypeople at first believed it cured a wide range of diseases, such as polio. After six months of use, however, people came to recognize its limitations. It is used for diarrhea in children, and occasionally for hangovers in adults.

Use of ORT, in the folk explanatory model, appears to be linked to its categorization as a food or as a medicine. The differentiation of foods and

medicines is different in the folk explanatory model. Tonics and vitamins are promoted as medicines with substantial food value. But foods are generally treated as regular consumables and freely given, and they are, for the most part, proscribed during illness. Medicines, on the other hand, are irregularly applied, but demand strict attention to preparation an administration.

ORT was considered both a medicine and a food, and countrypeople experimented with both its food content and medicinal value. The program promoted ORT as a medicine, through media campaign and packaging. Promoted as a medicine, greater audience attention could be focused on its preparation and treatment.

Diarrhea medicines, in the folk explanatory model, however, either promote defecation or inhibit defecation. This produced a problem for the program.

Chapter 5

FOLK MEDICAL TREATMENT DECISIONS

5.1 Investigating Explanatory Models: Two Studies

The folk explanatory model was investigated to determine impact on program outcomes. Since cases of empacho are generally thought to require the administration of a purgative, it was felt that parents would resist the use of ORT for the treatment of this disease, and continue to use folk remedies. Since is was felt that empacho would have to be addressed by the program, a convenience sample of ten mothers in Los Dolores were asked if they knew about a range of illness, including empacho. These illnesses include those attributed as primary causes of mortality in Honduras by the Ministry of Health, and an additional group of folk illnesses. Respondents were asked if they had heard of the disease, and if it was curable. All responded "yes" to both questions. They were then read a list of healers and asked "Can healer X cure disease Y?" The responses are listed in the 21 x 11 table entitled "Illnesses by Healer" (Table 9).

Almost uniformly, respondents believed that although cosmopolitan medical staff could cure diarrhea and dysentery, they would be unsuccessful in treating either empacho or ojo. Since the source of ORT would be the Ministry of Health (and a fictitious physician, "Dr. Salustiano", a major campaign figure), the staff felt that program messages were unlikely to be successful in convincing rural parents to treat episodes of diarrhea attributed to empacho with ORT.

No mothers interviewed in 1980 knew about dehydration. Those who recognized the word thought it was a synonym for malnutrition

Table 9

ILLNESSES BY HEALER

	Anyone	Masseur	Curer	Midwife	Guardian	Repre-sentante	Nurse	Spiritual Healer	MOH Physician	Physician	Hospital	TOTAL
Diarrhea	6	5	7	5	10	10	10	7	10	10	10	90
Neumonia (pneumonia)	2	-	1	1	2	2	4	2	4	4	4	26
Asfixia*	3	2	5	3	5	4	5	2	6	6	6	47
Siete dias*(neonatal tetanus)	5	5	8	6	6	5	8	2	9	9	9	72
Disenteria (dysentery)	5	4	2	5	9	9	9	5	10	10	10	78
Ojo*	7	10	9	8	5	4	1	1	-	-	-	45
Empacho*	4	10	8	7	4	1	3	1	-	-	-	38
Polio	-	-	-	-	-	-	-	-	3	3	4	10
Hinchazon*-(swelling)	2	3	3	2	1	1	5	-	8	8	9	42
Calentura (fever)	5	8	8	8	8	6	8	6	9	9	8	83
Fiebre lombrices (worm fever)	7	6	6	5	5	2	7	4	9	9	9	69
Fiebre tifoidea	-	-	-	-	-	-	2	-	6	6	7	21
Tuberculosis	-	-	-	-	-	-	-	-	3	3	3	9
Tosferina (whooping cough)	1	2	2	2	2	1	3	-	7	7	7	34
Sarampion (measles)	-	-	-	-	-	-	1	-	5	5	4	15
Paludismo (malaria)	1	1	1	1	2	1	2	1	5	5	6	27
Tumor	-	-	-	-	-	-	1	-	3	3	8	15
Diabetes	-	-	-	-	-	-	1	-	1	1	1	4
Desnutricion	3	3	3	3	3	3	3	3	6	6	6	42
Del corazon (of the heart)	-	-	-	-	-	-	-	-	4	4	4	12
Fluxion (flux)	2	2	3	5	2	1	5	1	5	6	6	38
	53	61	67	61	64	50	78	35	113	114	121	817

(desnutricion). This followed from the use of pre-mixed oral and intravenous solutions called suero that mothers were familiar with. These expensive solutions, literally translated into English as serum or whey are proscribed during empacho, since the gut is thought to need rest.

5.2 Application of Ethnomedical Results to Planning

A natural outcome of these findings could have been the promotion of ORT as a purgative, or at least as a specific treatment for empacho. A medical consultant to the implementation project, Dr. Myron Levine, was among the first to suggest such a strategy.

However, a decision was made against the promotion of ORT as a purgative or as a cure for empacho. Ministry staff physicians wished to avoid both the illness label "empacho" and the use of "purgative" in PROCOMSI activities. Empacho was not considered a disease entity and physicians did not want the program to appear to support purgative use particularly because traditional purgatives can increase the risk of dehydration and electrolyte imbalance.

ORT was promoted then, not as a purgative but as salts that were good for diarrhea and avoided dehydration. The concept of dehydration was unknown to countrypeople and had to be taught in the campaign, which began in March 1981.

5.3 The Two-Year Impact Study

In May of 1980 and again two years later (June 1982) a special survey was undertaken for the ethnographic study in the community of Los Dolores.

Households were censused and standardized interviews were conducted in all households containing children under five years of age in Los Dolores. The two-year impact survey measured:

Diarrhea morbidity and treatment, including use of ORT (2 weeks/one month, and six month recall of episodes with "diarrhea" defined by the mother).

Breastfeeding and nutrition (breastfeeding and weaning practices, list of foods consumed) for children less than three years of age;

Household demographic changes, including mortality; and

PROCOMSI campaign exposure, recall and recognition.

5.4 Results of the Two-Year Impact Study

5.4.1 Population

During the two year interval, the number of households, however, and residents did not change significantly. During the two-year period there were household changes in 17 of the 44 households due to migration, fosterage, or birth. Two households were closed and three new households were formed by fission of junior members of other households in the village. Interestingly enough, unlike other evaluation sites, of the total population in 1982 only 32 children (12.6%) are less than five years of age.

5.4.2 Morbidity

The morbidity survey was conducted in June 1982 only. For the two week period prior to the visit to each household with a child under five, mothers reported 12 episodes of diarrhea. These 12 episodes totalled 70 days of diarrhea with a mean duration of 5.8 days (s.d. 2.48). No child was reported as having had more than one episode, and specific incidence of diarrhea in children less than 60 months of age for a two week period between June 1 and June 22 was 375/1000. During the entire month (May 18th to June 22nd) a total of 17 episodes were reported in 17 of 32 children, for a total of 112 days of diarrhea (mean duration 6.58 days, s.d. 3.5) for a one month incidence of 531/1000 in children less than 60 months of age. These results are reported in Table 10. Clearly diarrhea is a salient problem. Information was collected for episodes (three in total) that occurred as long as six months prior to the intervention. There are grounds for suspecting that memory effects were responsible for the low number of cases reported, although diarrhea is highly seasonal and the sample is very small. There are no grounds for suspecting that the three cases reported between one and six months prior to the survey were in any way especially salient cases.

The MMHP evaluation has analyzed diarrheal morbidity for two data sweeps, occurring in the same season as this one, the first in June and July of 1981 during the rainy season, and the second in May and June of 1982. Thirty-six percent of the children were reported to have had diarrhea in the previous two weeks during the rainy season of 1981 while 34.5 percent were said to have been sick during the rainy season of 1982. These figures are quite similar to the 37.5 percent observed in this community.

In the area of feeding practices, there were 18 children less than

Table 10

Reports of Diarrheal Episodes, Days of Diarrhea and Specific Incidence of Diarrhea for Children under 5 Years Old in Los Dolores, Honduras

	2 week period (June 1-22, 1982)	1 month period (May18-June 22, 1982)	6 months period (Dec. 18,1981-June 22)
Episode/Days of Diarrhea	12 episodes / 70 days	17 episodes / 112 days	20 episodes / 123 days
Children under 5 (n=32)	12	17	20
Rate	375/1000	531/1000	

three years of age in 17 out of 44 households in Los Dolores. Of these 18 children, seven had completed breastfeeding at the time of the survey. Mean duration of breastfeeding was 16.85 months (s.d. 6.2 months). One mother reported never breastfeeding, and only one of the mothers reported breastfeeding for less than two months. One mother was still breastfeeding a child of 34 months, and other long duration reports from mothers still lactating were of 34 months and 27 months. All mothers suspended powdered or cow's milk during episodes of diarrhea, as well as meat, eggs, and many other foods. Breastfeeding mothers, however, continued breastfeeding during episodes. Thirteen of the 18 children less than three years of age were reported to have an episode of diarrhea in the previous month, but only three of the seven children still breastfeeding reported episodes. Although the numbers are too small to be significant and are confounded by age, diet, and behavioral differences, some impact of breastfeeding on diarrheal incidence may be reflected in these data. Table 11 summarizes the data on this issue.

5.5 Campaign Exposure, Recall, and Recognition, June 1982

The PROCOMSI campaign uses radio, print materials and personal contact to promote the use of ORT. Conventional measures of program impact are exposure, recall and recognition. Although these measures differ somewhat by media, they are similar to measures of access and coverage as they are used in public health planning. Radio exposure involves determining whether or not the household possesses a working radio and if so, the pattern of radio use. Recall measures test the ability of respondents to describe campaign slogans, jingles, and content without prompting. Recognition

measures are less stringent tests of ability to identify program components when they are described to respondents. Families were asked about the three major channels for implementation (radio, posters, and face-to-face instruction). Eight of the 24 households were without functioning radios at the time of the interview, although all households possessed radios. Two households contained posters, and seven of the 24 mothers reported seeing posters. No personal instruction was given to mothers by program implementors or evaluators.

All families claimed awareness of the ORT packet and its use; all could name it. All families claimed to have heard about it both through radio and by word of mouth. No mothers, except mothers in those households with posters, reported the posters as a source of information about the program. Although no mother knew the word dehydration or about ORT packets before program implementation, twelve of the 24 mothers correctly defined dehydration as the loss or absence of fluids in the body. Three of the 24 mothers could correctly recall the five components stressed in the mixing messages (mix with one liter of water, use all of one packet, give whole liter in one day, shake the bottle, throw leftover away after one day). Fourteen other families missed only a single component: the amount of fluid to give a child per day (one liter). Table 12 shows the numbers of mothers responding correctly. It appears that the promotion campaign has been successfully conducted in Los Dolores.

Data from the survey of mothers in the MMHP evaluation sample closest in time to the Los Dolores survey (April 1982), demonstrate similarly high figures for the sample. 85.3 percent of families reported owning a radio. 77.5 percent of the total sample had a working radio. Coverage of the population, expressed as the percentage of all mothers remembering hearing

Table 11

Breastfeeding and Diarrhea

	Presently breastfeeding	Not currently breastfeeding	
Episode of diarrhea in previous month	3	10	13
No episode of diarrhea in the previous month	4	1	5
	7	11	

Table 12

Mothers' Responses to Recall Items

Response	Number of mothers
Recalls product name	24
Recalls "dehydration"	12
Recalls mixing messages list (5 items)	3
Recalls mixing messages (4 items)	17
	20

Table 13

Attributions of Empacho and Use of ORT

	Use ORT	Doesn't use ORT	Total
Diarrhea attributed to empacho	0	8	8
Diarrhea not attributed to empacho	11	1	12
	11	9	

at least one spot on the previous day is 38.9 percent. The percentage of listeners who report having heard a spot between 6 a.m. and 9 p.m. by hour varies between 60.5 and 78.9 percent.

46.6 percent of the sample reported having seen a PROCOMSI health poster and could describe it, much higher than the percentage for Los Dolores. 92.5 percent of the total MMHP sample could identify "Litrosol" in April 1982. For preparation of oral rehydration salts, 94.2 percent of the sample who had used Litrosol reported mixing it with one liter of water. 95.7 percent reported using all of one packet. 59.7 percent reported giving the whole liter in one day. 83.5 percent reported shaking the bottle to mix the solution. 32.6 percent reported that they followed the campaign instruction to throw away the solution after one day.

5.6 Use of Litrosol

Of the 20 cases of diarrhea reported in the previous six months, eleven use ORT (see Table 13). Use does not imply that each and every case followed PROCOMSI's therapeutic regimen. For the most part, mothers gave less ORT than the prescribed liter per day. Nine cases did not use ORT. Eight of these diarrheal episodes were attributed to empacho.

The high rates of knowledge and practice are similar to those found in the larger evaluation survey. The program appears to have been successful in providing knowledge about ORT, and in achieving its use in the home. On the other hand, over a six-month period, nine out of 20 diarrheal episodes in children were not treated with ORT. Although there are grounds for suspecting the quality of recall of the three episodes that were reported to have occurred prior to one month, only one of the episodes reported did not

use Litrosol, and this was the only non-empacho episode in which Litrosol was not used. With this one exception, the diarrheas which were not treated with ORT were attributed to empacho. The initial findings from ethnographic investigation early in the program were confirmed: those episodes of diarrhea attributed to this folk illness are treated with purgatives, and not with ORT.

As demonstrated earlier, lay treatment does not proceed directly from recognition of symptoms to diagnosis. In fact, diagnosis is negotiated among family and health specialists during the course of the illness and its treatment. Empacho is rarely diagnosed early in an episode and when diagnosed is considered a serious and potentially fatal illness. In addition, empacho is characterized by other symptoms as well as diarrhea, such as abdominal pain. These "primary" symptoms are perhaps more salient than diarrhea as evidence of empacho. In fact, the term "empacho", which can be considered a symptom or an illness, overlaps incompletely with the disease category "diarrhea." Some biomedical researchers believe that empacho may be characterized by an etiology different from that of most diarrheas; one suspicion is a rotaviral agent, and another food allergies or other disorders of digestion.

5.7 Treatment Decisions - A Summary

The report so far has presented a description of the program context so that the reader might understand the operation of the project. The data, and especially findings about empacho present a picture of differentiated decision-making in a complex context. The data from the large-scale evaluation survey and the ethnographic data both point to large areas of

program success. The program has high visibility, appears to be effective, at both learning and behavioral change objectives and produces positive comments in rural areas. The results of an analysis of mortality data indicate a reduction in diarheal mortality. The program has been adopted by the Ministry of Health as a national-level program funded out of Ministry resources.

However, there are significant variations from the desired outcomes. Countrypeople use Litrosol for a number of illnesses, and many feel it actually halts diarrhea, not dehydration. Since it is unlikely that ORT halts diarrhea, countrypeople may not continue to use this therapy if confronted with chronic diarrhea. These problems, among others, demonstrate the need for continued monitoring of programs through evaluation.

Discussing the impact of a mass media project from the perspective of the community and the folk explanatory models demands consideration of a broader issue: How do mass media work to achieve its outcomes? How does it relate to and influence the explanatory models present in the community?

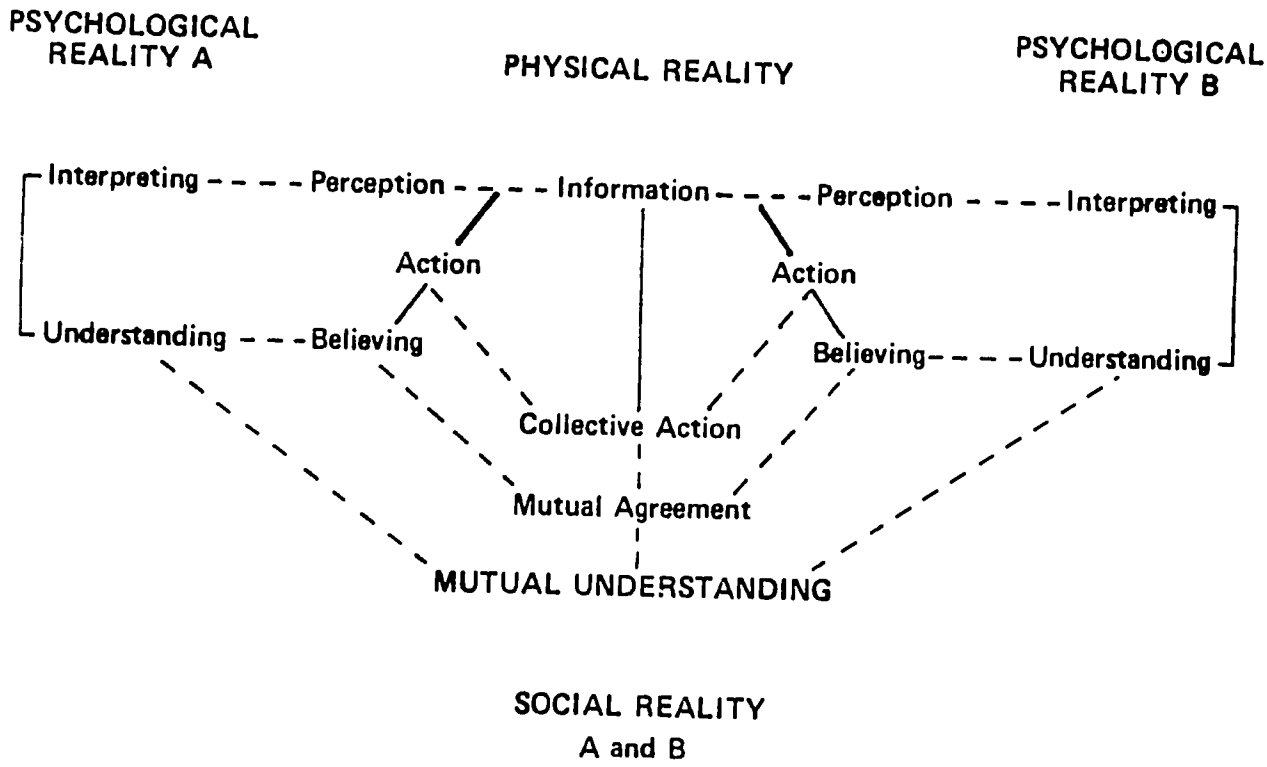
Schramm, Kincaid and Rogers, among other communication researchers have discussed a convergence model of communication. As discussed by Rogers (1980) a convergence model emphasizes active communication and accommodation, the network of meaning in diverse contexts and mutual understanding, and uncertainty concerning the truth status of statements, because of differences in context and belief system. A visualization of the model is shown in Figure 4.

This model leads to a negotiated outcome of media programs. The local explanatory models and practices and the cosmopolitan practitioner explanatory models intersect, and a negotiated new local explanatory model and set of practices is developed. In this context a test of the success of

a media intervention is not whether the audience adopts all of the campaign-promoted behaviors, but rather whether the campaign is more efficient than other kinds of practitioner-patient interactions in effecting maximum change. For extension of coverage programs there can be no doubt that mass media campaigns are effective, and campaigns that adopt this convergence model of communications are likely to be even more successful. In this light, PROCOMSI has been very successful in the incorporation of ORS into the treatment of diarrhea, and producing high knowledge levels of program components. However, it did not seem to change (in the short period of its duration) local explanatory models concerning certain classes of diarrhea, particularly empacho.

Figure 4

THE CONVERGENT MODEL IN COMMUNICATIONS



Rogers and Kincaid (1981:55)

Chapter 6

CASES

The previous sections have presented theoretical and quantitative evidence about the context and impact of the project. However, the best understanding of how such a project works may come from examining actual cases in context. The case-accounts that follow are the most accessible records of the investigation for the reader. They are edited in places for purposes of clarity, but otherwise are field notes from periods of ethnographic observation. These cases are "critical" cases in the sense that they have been chosen to delineate a special problem or underlying concern.

6.1 Case #1

S., 22, was appointed village health worker (Guardian) several months ago. The town nurse, Rita, who appointed her, felt that she was cooperative, and wanted to reward her family for this past cooperation. Last Friday, the last Friday of the month, S. attended the VHW monthly meeting in Nance. At that meeting she received 50 packets of Litrosol packed two to a folder in a plastic bag. At earlier meetings she had received posters and a cloth banner to place on her house. The posters were up in her house, and the banner hung outside her door. Unfortunately, her door cannot be seen from the road, but most of the town knows she has the medicine. Surrounding her house is the evidence of other Ministry activity. Her mother-in-law's house nearby has a new latrine, already well-used. In front of her house stands a dry well, capped with a fancy red hand pump.

The well was laboriously dug by hand by her husband, father and a neighbor, some of it through rock. But the well had to be dug to a depth of 30 feet, and was still a dry hole in the summertime. Finally the wall of the well collapsed, and the well stands as mute testimony to the difficulties of development.

Several weeks prior to my visit Delmer, age 3, began a lengthy episode of diarrhea, 10 days in all. S. assumed it was movimientos, and only brought the child to the clinic after 5 days. She didn't treat the child at all, she claims, because she had no Litrosol. The clinic prescribed Litrosol. She subsequently administered four liters of Litrosol to the child in the next six days. She claimed, referring to her own use, that many people don't believe a child can take a whole liter in one day.

I administered the questionnaire "Encuesta para Expertos" (Expert Survey) to her. S. knew about "dehydration", but did not understand the procedures for rehydration. She was also not clear about the mechanism of action of Litrosol. In addition, she was unfamiliar with the nutritional component of PROCOMSI messages. When asked about a compensatory diet for diarrhea she told me to only feed a child "sopitas" (broths of vegetables, or meat) and vegetables.

Interestingly enough, S. does not have a radio, and her mother-in-law's radio, 30 meters away in her house, has been broken for some months. What S. knows comes from her mother-in-law, husband, and the nurse, Rita, by word-of-mouth. This is not a fair test of this channel because of S.'s personal characteristics, i.e. she is definitely not the woman best suited to be Guardian in her village. Still it means there are no controls or tests for appointment as guardian.

A number of issues are touched on in this case:

- the integration of diarrheal disease control programs with other primary health care interventions.

- the limited training and supervision of VHW's.

- the superior control of message content in campaigns which rely on radios versus face-to-face interaction.

Distal personnel and program components of the Ministry health system, although by number the greatest component, receive the least amount of support, financial or otherwise. Radio can help bridge the gap between center and periphery, but only if systematically developed. It's interesting to note in this case that the VHW had both no radio and little program knowledge, although she had received the print materials and instruction from the health center auxiliary nurse.

In the absence of effective supervision and evaluation at the distal ends of the system, misinformation may be transmitted. Use of radio guarantees greater control of message content. S. does not represent the epitome of knowledge of PROCOMSI program content in the village. Many mothers had superior knowledge.

6.2 Case #2

L. is the health guardian of her community. She was the first guardian in Nance, and the most successful. She runs a general store (pulperia) distinguished by two bigger-than-life paintings of toy soldiers dressed in Beefeater's uniforms guarding the door. She is married to the wealthiest man in this village and their store boasts a television set powered by a car

battery.

L. distributes Litrosol but is also familiar with salt and sugar solutions for rehydration. She uses all the materials except the guardian reference sheet "Hoja de Referencia". This flyer is a small copy of a larger black and white poster displayed in all clinics. The flyer shows a baby suffering from dehydration with each sign clearly marked. If one or more are present the mother is supposed to take the child to the health clinic. As L. points out, the sheet has no clear value, since mothers derive no benefit from visiting the guardian first rather than just going straight to the clinic.

The treatment they receive with the sheet is no different from their treatment without it at the clinic, and they must still pay their fee (1 lempira). Using the sheet means bringing the baby to the guardian's house, which, unless it is on the road to the clinic is an extra chore. In addition, L. claims that few children in her community suffer such debilitating bouts of diarrhea. L. could not remember when the last child to die of dehydration died in there. Overall she felt the diarrheal disease program to be relatively unimportant for her community.

The issues touched on in this case are:

- the magnitude of the problem, and

- rationalization of program activities.

In general, the issue of the magnitude of the diarrhea problem has not been well settled for many parts of the world. Certainly, the problem is not homogeneous with respect to a country. Seventy-five percent of this community has piped water, evidently potable, as well as a well-trained and competent VHW. In this context the mortality-reducing component program may

be less necessary. Various components of the PROCOMSI program, such as nutritional interventions, would have an impact even in communities which suffer fewer deaths due to dehydration. However, these components were not has well-developed as program elements directed at home-based ORT, since mortality reduction was the priority goal.

The referral program is one example of a program element that is not widely used. It was developed to be consistent with Ministry conventions regarding health workers. Although it was little used in the region, it demonstrates a common problem of coordination of system components. Nurses and VHW's throughout the developing world, are often asked to perform tasks that make sense in isolation, but need to be well integrated into the total health care system.

6.3 Case #3

L. C. is 39 years old. She has given birth to fifteen children in seventeen years, thirteen of whom are still alive. L. C. has a two year old, Lilian, with what her mother describes as diarrhea. She doesn't have more than one stool a day, but that stool is "pure water" says L. C. With all her children at home, L. C. doesn't get out much. She sends one of her small children to pick up the packets. L. C. has only seen one poster, the breastfeeding poster. She's all in favor of breastfeeding and still breastfeeds Lilian (during the episode as well). She also uses Litrosol. She not only gives Lilian Litrosol every day (1/2 liter/day with or without disease symptoms) but drinks it herself. She claims it helps bring down her milk. After all, the campaign does promote breastfeeding.

In addition to Litrosol she gives Lilian "sulfabismuto", an adsorbent

antibiotic tablet, and the kaolin provided by the Ministry of Health. She would take anything else I recommended as well to stop the diarrhea. Lilian is a very small child, as are all of L.C.'s children.

This case points out several features of the program. First, the packets and the program are sometimes misused. At first, when the packets were introduced to Los Dolores they were used to treat almost everything, from colds to polio. ORT was, in fact, the only free medicine available. In addition, ORS is called <u>suero</u> or serum in Spanish. Suero is considered to have nutritive value and is taken frequently as a food supplement. (Interestingly enough, some diarrheal disease control programs are moving toward considering themselves nutrition intervention programs and adding nutritive supplements to the packet.) Although the actual caloric content of ORS is not high (approximately 78 calories), the ready availability of a free nutrient may be an incentive to misuse the use of the product. In addition mothers feel that medicines that they take are concentrated in breast milk. L.C., in fact, reported that drinking Litrosol led to a let-down reflex, and that Litrosol went straight to her baby through her milk. An additional and potentially dangerous misuse is mixing the salts with powdered milk in preparing a bottle, or adding powdered milk to Litrosol.

These uses require program monitoring. They are bound to happen in any extension of coverage program that is not tightly monitored. But they serve not only as a warning, but as an opportunity to discover the local explanatory model. For example, since countrypeople apparently understand the need for appropriate nutrition during diarrhea episodes an opportunity exists to promote feeding and compensatory feeding.

6.4 Case #4

Maria and Miriam her sister-in-law passed me on the road carrying Carlos Roberto, 20 months old, Maria's son. They rushed past and said nothing. Inquiring, I discovered they were en route to Alicia A.'s for a sobado (massage). That day, the child had been fed on corn gruel (atole de maize) and Maria thought he was empachada. (Alicia's daughter was originally chosen to be guardian, having both the interest and vocation for it. However the nursing supervisor needed a maid and nanny and offered her a position in Tegucigalpa in return for schooling to eventually complete her nursing degree.) Alicia A. gave the child a massage with a mentholated pomade, and gave the child a tablespoon of Milk of Magnesia to act as a "purgative." Maria had already been administering a tea of "araillan" root and kaolin. The next day without returning home she took Carlos Roberto to the clinic, not stopping at S.'s, the village health worker (even though she had to walk past S.'s house to get to Alicia A.'s). At the clinic, Thursday, Maria received Litrosol and more kaolin. Each subsequent day she gave Carlos Roberto 1 1/2 cups of Litrosol (cup = 6 oz), as a food instead of other foods and as a measure "to avoid vomiting".

The diarrhea "stopped" according to Miriam, on June 20th, four days later. Maria breastfed throughout the entire episode, and added, after her visit to Nance, bottled baby food. Miriam could not specify what kinds of food, but small Gerber bottles of fruit and vegetables are available. This was the second day of his "dieta" (regimen) following the episode of diarrhea and his diet was restricted exclusively to breastmilk, tortillas, sugar water, and Gerber food, all in small amounts. Maria knew the current PROCOMSI jingles by heart, and understood the relationship between "dehydration," loss of fluids and the fatal results of diarrhea. She

claimed her information came, however, from the longer radio show presented on weekends rather than from the spots. Given Maria's exposure and knowledge of the program it was disappointing to see her limited use of ORS.

This case involves the diagnosis of "empacho" as discussed previously. Empacho, along with other illnesses is classed as a category of disease that produces diarrhea, and is little known to cosmopolitan medicine. Because most physicians refuse to accept the patient's diagnosis of empacho, countrypeople are often loathe to visit the clinic when they feel they have empacho.

6.5 Case #5

Angela D. is a 47 year old woman who lives in T., a distant hamlet of Los Dolores. In March Angela's 4 year old son developed acute diarrhea with abdominal pains. She claimed she took the child to the clinic (T. is the hamlet nearest Nance), but a temporary nurse there (the usual nurse was on leave) told her that the diarrhea was really empacho. She brought the child home and administered a purge of cooking oil, followed by a massage and a tablespoon of kaolin. The treatment worked, claimed Angela, because several days later the diarrhea stopped. Angela continued breastfeeding the child during the episode.

When questioned about Litrosol she demonstrated considerable knowledge. She enjoyed the programs and radio spots, even if she didn't use the medicine (which may not have been available to her because of disputes between her family and the families of L., where the Guardian lives). When asked if the guardian, the doctor or the radio gave her more confidence she replied "listening to radio little by little allows you to have faith, and

the medicine (Litrosol) arrives and it works. Sometimes you got to a clinic and they give neither medicine nor injections ("Uno escuchando por radio poco a poco ponga fe, y sale la medicine y sirve. Algunas veces anda a una clinica y no se da medicina ni indiccion [sic]".)

Traditional treatments persist along with knowledge of the program. Even though Litrosol enjoys high recognition and use in rural areas it appears its use is tied to diagnosis. In the future, the program might concentrate on investigating parents' explanatory models, particularly with regard to symptoms, so that this problem might be addressed.

The PROCOMSI program incorporated a message about treating all diarrheas with Litrosol. This effort might be amplified, particularly by naming these diarrhea-related illnesses.

6.6 Case #6

Wilfredo C. and his new wife Lourdes have just moved into an old abandoned house. They sat in front of their house and talked to me. Wilfredo held their daughter Aminda during the interview.

Aminda was born July 16, 1981. One month before my interview with them (July 1982) she had suffered an acute bout of diarrhea. The diarrhea was accompanied by sharp intestinal pains, and although they tried some home remedies (Estomalito, an aspirin-based remedy and Terramicina, a tetracycline) the diarrhea continued. On the fourth day they took her not to the guardian or the clinic, but to the sobadora in Nance, Juanita. Juanita thought Aminda was suffering from an intestinal infection and injected Aminda with penicillin. Wilfredo claimed that this cured Aminda.

This was not the first time that they used Juanita. During the first

year of Aminda's life they had visited the sobadora three times, always for injections. In February they visited Juanita, the clinic and a private doctor. In this episode, the diarrhea was noticed almost immediately by Lourdes, and she made a trip into Nance to visit the clinic. At the clinic she talked to a nurse who gave her only kaolin, without Litrosol. She took it and returned home on foot to Los Dolores. During the night the diarrhea continued, and she was forced to return the next day. Again, she was given only the antidiarrheal, as it is called in the clinic, and she was disappointed. That same day in Nance, she visited Juanita and Aminda was given penicillin. Juanita felt, however, that Aminda was sick enough and young enough to warrant a trip to Tegucigalpa and so the next day, Juanita referred her to a private physician in Tegucigalpa, Dr. H., with whom Juanita had worked in the past. The doctor recommended two bottled medicines: Estretoenterol and Sulfamethoxazole trimethoprim. These medicines were given by the physician as part of his flat fee. They felt the medicines were effective. This is not an unusual treatment path.

Wilfredo and Lourdes are young and enthusiastic parents. They listened avidly to the radio when they could, although at the time of the interview their radio was not working. They knew about the Litrosol program, about the spots, and knew what dehydration was. They thought that Litrosol was a good medicine and a valuable addition to the medicines available locally. They personally had tasted it. However, they did not use it at any time in the diseases that had afflicted Aminda.

Younger parents are often treated as "insiders" and therefore an appropriate audience for mass media campaigns. The younger and less experienced, however, these parents are, the more vigorously they will pursue therapies. This is a conservative response in the face of

uncertainty. Multiple recourse to cure is probably the rule for common illnesses, not the exception.

6.7 Case #7

Marta B. lives in a small house overlooking the valley where the school is. She lives with Ruben A., an old and feeble man that has never lived up to her expectations. They live with their children and grandchildren, a total of 13 people in a house the size of a two-car garage, kept orderly only by Marta's constant intervention. The family is originally from C. and moved here eight years ago. Marta says she left C. because of the shortage of water there. Marta's household is also one of the poorest in Los Dolores, and they are eating tortillas made of sorghum at present.

Marta's three year old grandson, Esteban, has had diarrhea for a week and has it on the day of the interview. The diarrhea has not been serious, never exceeding three stools a day, nor are the stools especially different from normal. But Esteban has been complaining of stomach pains, and Marta thinks that is due to diarrhea. His appetite is unchanged and he shows no signs of dehydration. She has administered only "bismuto" to Esteban and doesn't plan to do much more unless the diarrhea gets much worse. He had a similar episode two months previously, while he was still using a bottle but she stopped using the bottle during the previous episode and does not plan to reintroduce it.

She has taken Esteban to Chevito, a local nurse, curer and midwife, once for bronchitis. He received penicillin injections twice a day for three days. She herself knows how to massage and in the beginning of June, when Esteban had lost his appetite, she massaged him and purged him with

"Pildoras del la vida." She's the only person I know in Los Dolores who uses "Pildoras de la vida." In February she claimed to get two packets of Litrosol from the guardian which she used. She offered a number of other recipes as well for illnesses, such as cloves for worms and salt water baths to cure fever. She was unfamiliar with posters on PROCOMSI but listens to the radio. Her favorite stations are local ones, however, and she doesn't listen that much to Radio Station HRN (where most program messages were broadcast). She was unable to define dehydration, confusing the term with malnutrition. A host of responses are predicated on that observation. She felt that children taking Litrosol during an episode didn't get thin, that it was a suero. She knew how to prepare ORS. She claimed she had heard Dr. Salustiano say that if the child doesn't eat, give him Litrosol.

The confusion of malnutrition and dehydration is based on several sources. First, in Spanish desnutricion and deshidratacion sound similar enough. To further compound this confusion ORS in Spanish is called suero, which is also the term for serum and whey. In addition, diet is an important part of treatments of illness. A health education program could respond to this in a number of ways - - by delineating therapy as a "new" therapy, or integrating traditional and modern therapies. In any event the central role of language must remain paramount in program planning.

6.8 Case #8

Marco Antonio and Marta live in the cleanest house in Los Dolores. They have one son and three daughters. The youngest, Mercedes, was born just before my visit, on April 13, 1982. At one month, Mercedes was hit with a series of diarrheal episodes that required her hospitalization in

Tegucigalpa. There she received Litrosol and kaolin. The diarrhea followed the introduction of bottles to Mercedes' feeding regimen. Marta introduced the bottle as soon as she returned to regular housework. Although she gave birth at home, she was able to have her sisters and sisters-in-law over to help with food preparation and cooking. As soon as her period of seclusion was over, however, and she had to resume her normal chores, she started an early morning bottle to calm the baby and give her time to prepare breakfast. She had not yet introduced other foods to her baby. She and her daughters were familiar with the PROCOMSI posters and most of the program, and she lives on the road that runs to Sarita's house.

Marta's mother is a famous midwife, known for her cures of fluxiones, ojo and caida, as well as her participation of childbirth. Marta knows folk medicine as well, but uses cosmopolitan medical services frequently. She was correct in defining dehydration and knew the mixing messages well. She had first tried the packets two years previously, but had not used them again until Mercedes got sick and they were prescribed in the hospital.

This case illustrates the difficulties of promoting exclusive breastfeeding in families with the economic resources to purchase bottles and milk. Convenience is an important part of Marta's decision to introduce a bottle. It also defines her as a modern woman. Although PROCOMSI identified these problems, it is unlikely that the radio campaign had much impact on these behaviors.

A curious contrast is found between diarrhea treatment strategies and the breastfeeding promotion strategy. On the one hand in the treatment strategy, parents are being told to abandon traditional treatment paths and adopt new therapy. On the other hand, in the breastfeeding promotion strategy, parents are being told to abandon a new feeding pattern and

maintain the traditional one.

6.9 Case #9

Emiglio and Maria del Carmen have a two year old son, Ervin Omar. Ervin had a serious episode of diarrhea that terminated two days before my visit. The episode lasted for 12 days and was considered serious by both parents. He had a fever during the last week of the episode, and the stools were accompanied by mucus. He had as many as 12 stools a day and had no appetite. Maria del Carmen claims that she stopped breastfeeding Ervin under doctor's orders, because she felt her milk was producing illness in the child. She had given Ervin a bottle before and continued feeding with a bottle after weaning from the breast. She continued the bottle through Ervin's episode, but withheld all other foods. She received Litrosol from the guardian and used it for three days, giving Ervin three liters of ORS. She was not satisfied with the therapy and felt it did not affect the true cause of the disease. The episode lasted longer than three days but she discontinued ORT. Maria del Carmen used a variety of healers. She was the only woman who reported using a partera to cure empacho. Empacho was a constant theme in our discussion.

Maria del Carmen believed that dehydration meant malnutrition. She clearly linked digestive disorders with diarrhea and empacho. Fluid loss did not figure at all in her use of ORS. She claimed to have heard the radio spots but was generally unfamiliar with the messages. She was familiar enough to identify the Dona Chela spots and referred to mollera caida, the fallen fontanels mentioned in the spot. She felt that the radio spots were not convincing ("no pega lo que dice"). The worm spot she felt

to be an advertisement for Sacalombrice, a popular vermicide. When I asked her general opinion of Litrosol she replied that it wasn't effective ("no llego") and when asked if it worked or not she replied "no llega hasta empacho" (it doesn't affect empacho). Generally she treated it as a food and/or vitamins.

Only continuous testing of educational materials will help elucidate the complicated interpretations of program material.

6.10 Case #10

The R. family in 1980 is a household containing 13 people who live near Los Dolores's school. Ruperto R. is a sixty-five year old man who enjoys lying on his hammock on the front porch and complaining about his health, while his wife, Marta Maria, attends efficiently to household duties. Three generations of R.'s are found in the house. One daughter who was living in the house in 1980 built a new house nearby, and has moved there with her children. She runs a small store and bar. Two grandchildren living in the house, Fredi and Wendy were reported to have had diarrhea that terminated two weeks before my visit. Wendy, two and one-half years old, had diarrhea for a week. Three days after onset Ruperto and his wife sent an older child to the guardian's house. They did not think the diarrhea was serious and they had administered nothing to Wendy. They received Litrosol, kaolin, and Piperazine from S. for Wendy and Fredi, and administered it all to her. Unfortunately, they mixed the Litrosol with milk powder instead of water, and felt that this was the best way to use it (since Litrosol was a suero or nutritive serum). Fredi was also administered the three medicines but since he was not drinking milk, did not have his Litrosol powder mixed with milk.

Wendi was lent to Ruperto by his daughter when she was two, and so he and his wife knew little of her early nutritional habits. Although they had other small children in the house during my stay in Los Dolores they knew little of the program. They could not identify any of the PROCOMSI posters but had heard about Dr. Salustiano. They mistakenly reported that a Dr. Salustiano poster had been posted in the village. In June they had visited the male nurse and curandero, Chevito in Nance for another episode of diarrhea in adults. They also called, in June, for the packets of Litrosol and claimed they received instructions concerning its preparation. The health promotor had visited their house at least ten times during my stay in the village, and visited the last time in April to finish and inspect the latrine. Their house is also home in Los Dolores of the female teacher in town, and so their contact with outside sources of information is high. They listen frequently to the radio..

Although contact with potential sources of information about the program was high, Ruperto did not know the meaning of dehydration, confusing the term with malnutrition (desnutricion), saying that the term referred to weakness especially when swollen (debil, se pone hinchado). To avoid dehydration, he felt it was important to take vitamins and to avoid death from diarrhea it was important to take a number of antibiotics. Although he was familiar with the radio spots and could identify the different components of the messages, he was unclear about their meaning. In short, he felt that Litrosol was a serum, a suero, in powdered form, containing food energy and vitamins. He held this belief even though he was familiar with the Dr. Salustiano radio spots. He had contacts with Ministry staff in Nance about diarrhea, but had not spoken personally to the guardian in the town, S., about the medicines. Litrosol was used then because of its

nutritive value and the perceived relation, in rural areas, between diarrhea and malnutrition.

When I questioned Ruperto about the use of the medicines, and why he used the medicines in the fashion he did, he and Marta explained their model of therapeutic action. Although medicines are effective in treating diseases, the success of their use is dependent on the faith in the medicine the user has. Thus, a child gets better because of its faith in the person who treats him, and the medicine works for a parent because of his faith in it. Use of a medicine is a test, then, and therapeutic efficacy consists of a physical or material component and a spiritual or mental component. This explicit philosophy accounts for many medical failures that countrypeople suffer. At the same time it guarantees a cheerful and supportive response to the question "Is Litrosol good?"

6.11 Case #11

Roberto and his wife Catalina live in El R., high above the valley of Los C., where most of my work was done. Roberto is the son of Ruperto. His son, Victor Benito, two and a half years old spent six days sick with diarrhea the previous week. Victor, who had just been weaned, had no fever but his stools, as many as four a day, were accompanied by mucus. Victor vomited occasionally during the episode and lost his appetite. Roberto sent one of his children to get the packets of Litrosol, as well as the kaolin and commercially purchased Estomalito. They administered the Litrosol for two days using the entire liter both days. They continued, in addition, to offer water and coffee. They offered him food but Victor declined to eat most of everything for the six day period. They administered no purgative.

Roberto is too poor to own a radio and had seen none of the posters. He claimed to have heard some of the Dona Chela radio commercials in his father's house, although Ruperto himself was unfamiliar with Dona Chela. Like his father he believed that dehydration was a nutritional disorder. He used Litrosol and felt it was effective. In his own words he described the episode. "Victor had an upset stomach. We offered him the liter. The child took the fluid and drank the whole thing. The next day we offered him another liter. He drank it down again. On the third day, the child's appetite returned. He ate, fell comfortably asleep for the first time in days, and did not soil his bed. The next day he was fine."

6.12 Case #12

Ilsa N. is a 36-year old woman married to Gustavo A., one of the many A. brothers in Los Dolores. Her house is located near a creek, where she gets her water for drinking, bathing and washing. She stores her drinking water in the kitchen in a clay jar, floating the gourd she uses for dipping on the surface of the water. Her kitchen is a room adjoining the main room of the house, and has the minimum of equipment for a rural kitchen. She washes her dishes in a a plastic bucket kept on the ground or on the hand-mill stand. Her house is exceptionally clean, and her kitchen well-scrubbed. Ilsa is a very concerned mother, worried about the program, diarrhea, and her house. The family has no latrine, and defecates in an area about 30 meters from the house. She maintains a small supply of medicines in the house. The medicines include mentolina, a commercially prepared pomade, a number of preparations of sulfa drugs, nose drops, and Laxol, a mild laxative used frequently as a children's purgative.

When I first interviewed Ilsa in 1980 she replied readily to my questions about diarrhea treatment and cure:

Q. What is diarrhea? A. Stomach disorders that are caused by many things, sometimes fruit, like mango.

Q. What are other names for this disease? A. Dysentery.

Q. How do you recognize this disease? A. Stools with blood.

Q. When does it strike? A. Anytime.

Q. What are the principal causes of diarrhea? A. Bad stomach (mal del estomago). Bad belly (mal de variga).

Q. How do you cure it? A. Terramicina (Tetracycline).

Q. How do you avoid it? A. Sour orange.

Q. What diet do you use with diarrhea? A. Yes, you use a diet, avoid getting wet, and avoid foods that cause damage.

Q. Do you purge your child when your child has diarrhea. A. They say no, because it's bad to purge your child with diarrhea.

Ilsa has six children. Naun Gustavo is the youngest, almost three years old. Naun had one day of diarrhea, Ilsa reports, just two weeks before my visit to her house. She didn't think it was a severe case, and on the first day she administered Alka-Seltzer and Coca-Cola. This settled Naun's stomach and she was satisfied with the remedy. Naun was often ill with diarrhea. She did not breastfeed Naun, and gave him bottles until he was two years old.

Ilsa was familiar with the program, listening frequently to the radio programs and being very interested in the medicine, But she, like others in the community, is unfamiliar with the concept of dehydration. She thought it was desgaste (wasting) and associated the problem with malnutrition. For that reason, she explained why Litrosol does not really cure diarrhea. She

felt it sustained the child, while the other medicines that were taken concurrently with the program were effective ("no es que alivia Litrosol es que sustiene el nino."). When I questioned her about some of the spots, particularly the spot about worms, she confused the PROCOMSI messages with vermicides. When I asked her to give her opinion about Litrosol, she explained "It's salty. It's pure serum that you extract from the whey." ("Es saladita. Es puro suero que se saca de la cuajada.") When asked about the preparation of the solution she was accurate in all but the administration component, not wishing to give all of the liter in one day and saying that one shouldn't.

6.13 Case #13

Pedro C. lives with Maria del Carmen R., sister of Ruperto, their daughters and grandchildren. I interviewed one of her daughters, Neli, 26 years old. One grandchild, Ricardo, was ill just prior to my second visit. Ricardo had a persistent and chronic diarrhea that went on for weeks, his grandmother claimed. The diarrhea was accompanied by fever and mucous stools, but no blood. They thought the case was very serious, especially since he lost so much appetite. The case was so bad, in fact, that they took him to the hospital in Tegucigalpa. Ricardo was born in Tegucigalpa, where he had lived with this mother, and had been taken many times to the hospital where he had been treated with a number of remedies. Although the house did not have a working radio and none of the adults were aware of the program posters, Neli was familiar with the messages and the campaign. She knew the meaning of dehydration, although still closely associated its effectiveness with its nutritional role. Unfortunately, the family believed

in the efficacy of medicine as practiced in the hospital, and tended to wait with an episode until it reached a sufficiently severe level that it required treatment in Tegucigalpa. Equally unfortunately, the program in the hospital did not help make mothers aware of Litrosol. Neli was familiar with it. She says that Pedro had taken some when it first arrived in the community to see if it was okay and then administered it to the children in the house.

This case demonstrates the need for integrating campaign messages and seeking the active cooperation of the medical establishment.

Chapter 7

CONCLUSIONS

This report has documented some aspects of the integration of oral rehydration therapy and the operation of a mass media-based health education campaign in a rural Honduran environment. The nature of this environment, in a biological and social sense, is not well known. Although impact defined in programmatic terms is better documented by the longitudinal survey component, this document hopefully aids the reader to set the program in a contextual frame. Familiarity with the context for program implementation requires some familiarity with the geography of the Central American region, diarrheal disease control programs and the social and cultural context in which this program promoting change in health behavior worked.

The PROCOMSI program is widely known and incorporated in rural health practices in the two villages identified in the study. Program implementation extends to use and changes in practices, not only changes in knowledge. Diarrheal disease episodes are commonly treated with Litrosol and other elements of the campaign are also well known. Mothers correctly mixed the solution. The campaign also successfully incorporated many folk beliefs in its promotion, and developed a special rapport with rural Hondurans. The program correctly identified the household as the appropriate social unit for implementation, and its familiarity with the domestic context was demonstrated in its programming.

During the period of the study the program did not differentiate among causes of diarrhea concerning the use of ORT. In cases of "empacho" (a folk illness found widely in Latin America) and strongly held beliefs concerning

feeding and purging, the beliefs and some practices were not changed during the life of the project. The interpersonal component of the campaign was not well developed in the two communities in this study. Rural auxiliaries and volunteers sometimes did not know the program's messages well and the referral system were not well developed either. Finally, it appears that despite these limitations, the program encouraged mothers to administer ORT to their children.

APPENDIX A

APPENDIX A

THE MASS MEDIA AND HEALTH PRACTICES EVALUATION IN HONDURAS: A REPORT OF THE MAJOR FINDINGS

EXECUTIVE SUMMARY

This is a report of the major findings from the evaluation of the Mass Media and Health Practices Project in Honduras. The project was an undertaking of the Ministry of Public Health, with technical assistance from the Academy for Educational Development. It was known in Honduras as the Proyecto de Comunicacion Masiva Aplicada a la Salud Infantil (PROCOMSI). The project and the evaluation were funded by the Office of Education and the Office of Health of the Bureau for Science and Technology, United States Agency for International Development (USAID), with additional support from the USAID Mission in Honduras and the Ministry of Public Health. The evaluation was performed by the Institute for Communication Research and the Food Research Institute of Stanford University and by Applied Communication Technology.

The purpose of the PROCOMSI project was to introduce oral rehydration therapy (ORT) and other behaviors related to the treatment and prevention of infant diarrhea in rural Honduras. The target behaviors included treatment of acute cases, preventive actions that mothers could perform, and related nutritional and breastfeeding activities. The treatment behaviors involved the administration of an oral rehydration solution mixed from packets of salts containing the World Health Organization ORT formula. The packets were manufactured in Honduras and distributed at clinic and community levels by the Ministry of Health.

The project and the evaluation were also designed to test the efficacy of an intervention strategy that tied elements of

several different approaches into an integrated campaign. The PROCOMSI intervention used broadcast, print, and interpersonal communication channels to deliver a coordinated set of messages about a fairly narrow set of issues - - responses to infant diarrhea. The knowledge and behavioral objectives and the strategies for behavioral change were developed using intensive planning research and the principles of behavioral analysis. The campaign incorporated elements of social marketing and systematic development of messages using formative evaluation.

The evaluation tracked the process of the intervention's effects, as well as measured the impact of the entire effort. It used a model of the program effects that stipulated that, in order for a final outcome to be achieved, a series of interim steps must be successfully completed. These steps included determining: that the population had access to the channels of communication used by the campaign; that the messages actually reached the population through those channels; that the content of the messages was learned and retained by the audience; that members of the target audience actually changed their behaviors in response to the campaign; and that the health status of children was improved as a result of these changes in behavior.

The reporting of findings about these different levels is organized into three major categories, which correspond to the second, third, and fourth chapters of this report. Following an introductory chapter describing the context and the research and measurement plans of the evaluation, the remaining chapters take up, in turn: the access and exposure to campaign elements and cognitive changes resulting from that exposure; behavioral changes related to infant diarrhea; and health status changes. This summary will report the findings in the same order.

The <u>context</u> in which the project took place is typical of many parts of Central America. The area is in South-Central Honduras, with terrain ranging from rolling hills and valleys to

steep mountains. It is populated primarily by subsistence farmers, although some parts support large-scale commercial agriculture. Half of the subsistence farmers own land, and their major crops are corn and beans. Communities are small (seldom larger than 1000 people), and houses are often widely separated from one another. The county seats have service infrastructure (roads, bus service, a health center, and telephone service), but services in the other communities are usually limited to a primary school.

The evaluation design included a number of studies with different methodologies, but relied primarily on large-scale survey data from repeated visits to a panel of mothers of small children. A sample of roughly 750 mothers was selected from 20 communities; these mothers were visited monthly for interviews about various aspects of the campaign. To control for the influence of repeated measurements on the sample mothers' knowledge and behaviors, comparison groups were also measured in additional communities that received all the elements of the campaign but not of the evaluation. The experimental and control samples were structured to yield quasi-equivalent groups of women of child-rearing age that were representative of the full range of differences found in Honduras. Examples of the other study approaches include anthropometric measurement, behavioral observations, community mortality, and health professional interviews.

Access to the channels used by the campaign was high. Radio carried the largest portion of the campaign's messages. On the average, two thirds (67.4%) of the families had a radio that worked on any given day. Radio ownership was higher (79.5% of families) but radios went in and out of service, usually due to dead batteries. Radio listening peaked in the early morning and at noon, and tapered off fairly abruptly after eight to nine in the evening. An average of 60.0 percent of mothers listened to the radio on any day. These levels represent strong evidence

that access to the population through radio is a feasible strategy.

Access through interpersonal and print channels was also confirmed. Interpersonal contacts with health care workers and traditional healers were measured. In general, families reported about one contact every six months with some type of care worker, with the majority of contacts taking place at fixed facilities. When contacts with traditional sources of care were included, the cosmopolitan health care workers at both community and fixed facility levels accounted for four out of five contacts (80.5%). Traditional healers accounted for the rest. There was clearly enough contact with the health care system for it to function as an instructional channel. Print access was conditioned by literacy. Over half of the mothers in the sample (56.8%) could read well by themselves; the household literacy rate was 86.8%, so there was almost always at least someone in a household who could read print materials.

Exposure to campaign messages through the different channels was the second link in the chain. Radio coverage with PROCOMSI spots or programs was extremely high, as might be expected given the saturation of the airwaves with campaign messages. For mothers actually listening to the radio in a given hour, the odds of hearing a spot were two out of three (66.7%). When mothers who were not listening at that time were included, the total population coverage was 11.4 percent of the mothers reporting hearing a PROCOMSI message each hour from four a.m. to nine p.m. Reaching roughly ten percent of the population every hour of the day with a campaign message was an extraordinarily high rate of coverage. Over the course of an entire day, nearly three-quarters (73.2%) of women who listened to the radio at all during the day reported hearing at least one spot. Even if women who did not listen to the radio were included, coverage was still 43.9 percent of all women hearing a PROCOMSI spot every day. Obviously, women who listen to the radio were getting high

exposure, and enough women were listening for messages to be very well diffused in the population.

Print media exposure consisted primarily of seeing posters printed for the campaign or the instructional materials in which the salts were usually packaged. When mothers in the experimental group were asked to describe health posters they had seen, an average of over 40 percent could describe a poster thoroughly enough that it could be identified as a PROCOMSI poster. Most of the posters were seen during visits to the health center.

Learning changes resulting from exposure to campaign messages were investigated. The content of some messages was known long enough in advance to permit collection of baseline information prior to the first broadcasts. In general, these measures showed an extremely rapid rise in knowledge within a short time after broadcasts start, with the rate of gain gradually diminishing over time. For those messages which were not identified far enough in advance to permit the gathering of pre-broadcast baseline information, the learning curves showed a truncated version of the general pattern. These variables show a pattern of starting at a moderately high level and continuing a gradual rise to a still higher plateau. A separate analysis of the effect of withdrawal of some messages (as in the seasonal phasing of message content) shows clear evidence of "forgetting" of information at a slow rate, beginning as soon as the messages are discontinued. It appeared that the relationship between exposure and learning was consistent and stable across item-types and content areas. It followed a pattern of extremely rapid initial rise, followed by slow arrival at a high plateau. A gradual decline in knowledge level about specific topics began as soon as messages on that topic were stopped, but reintroduction of those messages recovered the lost ground very quickly.

Learning results on specific items or topic areas are reported in detail in the main body of the report. Two examples

of measurement of learning in major areas are knowledge about Litrosol (the name given to the oral rehydration salts), and knowledge about breastfeeding. Litrosol awareness was not measured prior to the broadcasts because it had never existed before. Within six months after broadcasts began, however, half the mothers (49.5%) could name it as the medicine being promoted. By the end of the period, this figure seemed to have leveled off at about three-fourths of all mothers able to remember the name of the medicine. A composite index of breastfeeding knowledge rose from 9.2 percent before any significant broadcasting about breastfeeding began to 41.1 percent at the end of the project. An index of the ability of mothers to complete the jingles used in the campaign, which is obviously zero before the campaign, had jumped to 50.5 percent within six months and continued to rise to 56.0 percent by the end of the study period.

Thus the evidence is clear that a great deal of learning of the specific content of campaign messages took place. The pattern of acquisition and retention of the knowledge, plus evidence from various control groups, indicated that the measured changes reflected real learning, and not merely the effects of repeated measurement of the population.

Health-related behavior change is the next step in a successful path to summative project impact. The evaluation focused its analysis in three major categories - - diarrheal disease and the use of Litrosol, feeding behaviors, and observation of the preparation and administration of Litrosol. Prevalence of diarrhea was high and showed seasonal fluctuations. Point prevalence among children five years or less in age averaged 14.3 percent in the rainy season and 9.9 percent in the dry season. The distribution of cases by age shows the expected concentration of cases among younger children, with a peak roughly between 12 and 24 months. There was a slight tendency for male children to be reported sick more than females - - males accounted for 55 percent of the total reported episodes.

Litrosol use was measured both as a percentage of mothers who had ever tried it and as a percentage of episodes being treated. Within six months of the start of broadcasting, over a third of the mothers (36.7%) said they had tried Litrosol. This percentage rose to 62.4 percent by the end of the intensive campaign. This is a very high level of trial usage by any standards. When calculated as a percentage of episodes occurring in the two weeks prior to the interview (the most reliable reporting period used) the proportion of episodes treated rose from none before the start of the project to a maximum of 35.7 percent, with an average of roughly 28 percent of episodes over the final 18 months of the campaign. For cases recalled from the last six months, mothers reported much higher usage rates, averaging 45 percent of episodes over the final 18 months of the campaign. The most likely interpretation of this discrepancy was that mothers tended to forget milder cases and hence unconsciously selected the more severe episodes in recalling past behavior.

Younger children were more likely to be treated than older ones (33.6% of episodes in children under 12 months were treated, while only 23% of episodes for children older than 48 months received Litrosol). There were no consistent differences in treatment probability by sex. One municipio (Yuscaran) was consistently better than the rest, and cases occurring in villages were much more likely to be treated than those occurring in the county seats, but there was no clear explanation for the difference. More serious cases were slightly more likely to be treated, but no single indicator of severity was a consistent predictor of high treatment probability.

Mothers received their Litrosol from a variety of sources. Although the distribution of particular sources changed over time, sources in the community accounted for over half of the distribution, with clinics accounting for most of the rest. The single most useful source of information for learning about how

to mix and administer Litrosol was the packet itself, which came in an envelope printed with instructions. However, interpersonal instruction (from health care workers) and learning from the radio also were significant information sources. Mothers who had used Litrosol were generally using it according to campaign instructions. They reported correct mixing behaviors in using a liter of water and using the whole packet of salts over 90 percent of the time. However, they did much less well at behaviors such as throwing away unused liquid after one day (an average of 36% of mothers) and knowing that they should seek help if three days of Litrosol use did not improve the situation (an average of 10%).

Use of other medicines concurrently with Litrosol was common - - an average of 43 percent of Litrosol-treated cases were also reported to be treated with other medicines. About 20 percent of all episodes were taken to the clinic for treatment. Slightly over ten percent of cases were seen by village health workers. Both these numbers remained stable over time. Reported treatment by sobadoras or other traditional healers averaged four percent of episodes, but fluctuated more over time. The relationship between Litrosol use and the seeking of care from those sources for diarrhea episodes occurring in the last two weeks and in the last six months was tested for significance; clinic contact was significantly more likely to result in Litrosol treatment in eight out of twelve comparisons, while village health worker contact was significantly related to Litrosol treatment in ten out of twelve comparisons. Village health workers clearly played an important role in providing Litrosol, probably because they were easily available and because they had few available responses other than offering Litrosol. Clinics were also important sources, but they may have made more flexible responses than village health workers. Interestingly, use of traditional care sources had no effect on the likelihood of Litrosol use - - people who sought help from healers were just as likely to use Litrosol as those who did not.

Feeding behaviors, particularly breastfeeding and feeding during episodes of diarrhea were also targets of the campaign. Breastfeeding prevalence and duration were high in rural Honduras and appeared to have been increased by the campaign. Early in the intervention, 65 percent of children under 18 months were breastfeeding; by the end of the campaign, the number had risen to 81 percent of children under 18 months. Similarly, bottle-feeding of the young children dropped from 64 percent to 50 percent over the same time period. Continuation of breastfeeding and bottlefeeding during episodes of diarrhea was at about the same levels (i.e., virtually all mothers who were breastfeeding or bottlefeeding reported that they continued to do so during episodes of diarrhea). There was a slight rise in the giving of other liquids during episodes, and the rise was slightly sharper for younger children than for older ones.

An observational study was conducted for a small number of mothers to measure treatment behaviors directly. The mothers were selected when they brought their children to clinics complaining of diarrhea and observed afterwards in their homes. A total of 50 percent of these cases were treated with Litrosol, either before coming to the clinic or during the observation period at home. Mothers who did treat during the observation period gave Litrosol at a rate that would, if sustained, result in the consumption of a liter in 10 to 15 hours. Mothers were tested on their mixing skills after the observation period and performed quite well. The average mixing volume was 926 cubic centimeters, with a standard deviation of 218. Only one mother in five had a bottle of exactly a liter volume. They used all the salts (94%) and surprisingly, used boiled water (97%) even though the instructions did not require it. Thus, mothers were observed to mix accurately and to administer in amounts that would be clinically effective, if they gave Litrosol at all.

Health status change was the ultimate objective of the campaign effort. Health status was measured with a variety of anthropometric measurements as well as mortality rates. There was evidence that the overall nutritional and growth status declined during the campaign period. The percent of stunting went from 27.8 percent to 33.4 percent for boys and from 31.1 percent to 38.3 percent for girls. The percent "normal" under the Gomez categories fell from 43.4 percent to 36.7 percent for boys and from 40.9 percent to 33.3 percent for girls. However, wasting was essentially zero throughout, and there may even have been a slight improvement in arm circumference measures over time. The decline in nutritional or growth status seemed to be a secular trend toward increased growth retardation. It was consistent across sex, age, municipio, and type of village. However, there was no evidence of acute wasting.

Mortality data were collected from the official Death Registries kept in the county seats. An analysis of mortality for children less than five using the cause of death reported by the mother showed marked declines in deaths involving diarrhea in any way. In the two years prior to the campaign, death of children under five involved diarrhea in 39.8 percent of the cases. In the two years after the start of the campaign, deaths involving diarrhea fell to 24.4 percent of all mortality, a statistically significant drop. Total mortality dropped, although by a slightly smaller amount. Virtually identical reductions in the percentages of cases involving diarrhea before and after the campaign are found when the analysis is restricted to children less than two years and to children less than one year, but the drop in total mortality is smaller. The changes are also consistent when analyzed by time relative to the start of the intervention. There may be multiple causes for these reductions in reported diarrheal mortality, but it does appear that there has been a reduction in diarrheal deaths that can be attributed to the oral rehydration intervention.

In sum, the evaluation has found that the campaign environment and impacts were as follows:

-there was good access to all the communication channels used by the campaign;

-the target audience was heavily exposed to campaign messages through those channels;

-the exposure resulted in learning gains across virtually all the topics covered in campaign messages;

-the audience adopted the promoted behaviors at high rates and sustained the behavior changes over time at high enough rates and with sufficient accuracy that an impact on health status could be expected;

-the nutritional status of children worsened over time in ways that suggest a secular trend related to Honduras' difficult economic situation;

-and mortality involving diarrhea has declined sharply, with a corresponding, though smaller, drop in total mortality.

The pattern of the findings is consistent and provides strong support for the conclusion that the approach used by the campaign can be a very effective tool for accomplishing change in health behaviors in rural populations. It also suggests strongly that when the behavioral change being advocated is adoption of home-based oral rehydration therapy, the complex behaviors involved can be taught to a sufficient degree of accuracy that impact on aggregate health status can be detected.