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10. Abstract (optional - 250 word limit)  
 This report details the development and implementation of a KAP baseline survey in 9 villages in the 2 northern districts of Belize as a baseline for new villages entering into the project activities. These villages had never had other project activities prior to the start of the MACH 2 project, as opposed to those described in the report detailing the results of the baseline survey in 12 villages in 1987. Results in this survey showed that mothers don't know how to administer ORS correctly, less than half of mothers consult care in the first trimester of pregnancy, and that there is a downward trend in immunization coverage of under-ones since the EPI campaign of 1986. Recommendations are for increased focus on health education and community participation and work with the MOH to find incentives for the voluntary CHWs to deflect attrition. A post-project survey will be conducted in 1990 to document changes after the 4 years of the project.

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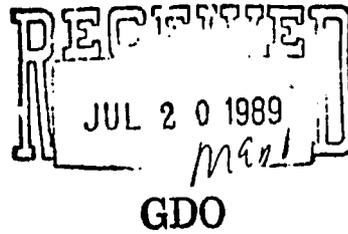
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**REPORT ON THE KAP SURVEY  
CARE / BELIZE  
MATERNAL AND CHILD HEALTH PROGRAM  
PHASE II  
(MACH 2)**

**Prepared By Lorelei Dickey  
February/March, 1989**

for GRANT NO, 505-0037-G-OPG-8001-00

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## EXECUTIVE SUMMARY

This is a report on a baseline Knowledge, Attitude, and Practice (KAP) survey conducted on a sample of women with children under five years old in nine villages in the Northern districts of Belize, Orange Walk and Corozal. The total number of women interviewed was 150. Topics of the survey were pregnancy, childbirth, child feeding, family planning, acute respiratory infections, diarrhoeal diseases, and immunizations. This baseline information was collected for the Maternal and Child Health (MACH) project CARE/Belize phase II, or MACH 2 February 1989.

Some important differences between a similar baseline KAP survey conducted for MACH 1 in July, 1987 and the baseline KAP survey for MACH 2 are: 1) more mothers have knowledge why tetanus injections are recommended in MACH 2 than in MACH 1, 2) in MACH 2 only 44% of the women interviewed responded that they had breastfed their youngest child, which is quite less than the 96% reported in the MACH 1 survey, 3) results on the incidence of ARI differ, with an incidence of ARI within the last 2 weeks of 70% in MACH 2 and only 42% in MACH 1.

Significant findings in addition to the above differences are that 1) many mothers know how to mix ORS correctly but don't know how to administer it correctly, 2) many mothers believe that ORS treats the diarrhea, 3) while most women went for at least one pre-natal visit, less than half of them consulted someone during the first crucial trimester of pregnancy, 4) mothers lack knowledge of appropriate weaning foods and weaning practices, 5) only 31% of women interviewed use a method to prevent pregnancy, 6) the % of children fully immunized at 12 months is 70%, which reflects the downward trend of immunization coverage since a national campaign in 1986.

Some recommendations are: 1) health education and community participation training should be given to CHWs, 2) focus needs to be made on areas of the KAP survey that need the greatest emphasis, 3) provide for incentives, supervision and support for CHWs, 4) improve communication among MOH, NCO, and MACH 2 personnel. Results of this are to be shared with MOH, NCO and MACH 2 personnel.

## INTRODUCTION

MACH 2 is a continuation of the first phase of the project, MACH 1. MACH 2 started in May, 1988 and will be working in a total of 28 villages in addition to the 12 that were included in the first phase. The purpose of this survey was to determine the baseline knowledge, attitude and skills of women in some of these 28 villages with regard to child survival issues. When the project finishes in 1991, the survey will be repeated among women in these same villages.

The focus of the project is basically health education. The final goal of MACH 2 is to improve significantly the health status of 4,000 women of child-bearing age and 3,000 children under five years old in 40 of a total of 58 villages of Orange Walk and Corozal districts.

A KAP baseline survey conducted for MACH 1 in July 1987 demonstrated that the maternal and child health problems in the northern districts of Belize relate to the lack of knowledge among

mothers of small children about the nutritional value of local foods, and the need for complete immunizations. This KAP survey was conducted in villages where another health intervention, the Village Level Water and Sanitation program, was ongoing, which was not a factor in the second KAP survey. One objective of the MACH 2 KAP survey was to look at differences between the first and second baseline surveys; however, differences may be attributable to this intervention of the VLWS program, either directly or indirectly.

Other child survival concerns are the inability of the Ministry of Health (MOH) to reach women in small, scattered villages due to budget constraints and the need for better collaboration between CARE, the MOH and other agencies working in rural areas.

The MACH 2 project will address these issues and attempt to achieve its final goal through three levels of interventions:

**Level one activity:** Takes place in the villages, with the training of Community Health Workers (CHWs) who will then provide training in health education for mothers of children five years old and younger in their own villages regarding child survival initiatives.

**Level two activity:** Takes place at the district level which will use project Community Health Organizers (CHOs) and District Trainers (DTs) to conduct training sessions for the CHWs and to monitor village activities. The CHOs and the CHWs will also provide individual support to the District Public Health Nurse and Rural Health Nurses in the conduct of the health center and the mobile clinic maternal and child health sessions.

**Level three activity:** These activities will consist of the further cultivation of strong ties between the CHWs and the MOH Primary Health Care Division by working with the District Health Teams, the Rural Health Nurses and the District Public Health Nurses; coordinating with the MOH in their training programs for district personnel, participating in various MOH committees working to alleviate the problems and providing other support to the MOH as identified during the life of the project.

Although the final goal will not be measured, the intermediate goals which will be measured at the end of the project are:

1. Increase to 75% the number of women of child-bearing age in 40 villages of a total of 58, in northern Belize, who are practicing improved child survival activities by 1991.
2. Increase the availability and accessibility of MOH child survival activities in 40 of a total of 58 northern districts of Belize by 1991 and provide for their sustainability beyond 1991.

### **Critical Indicators for Project Monitoring and Evaluation.**

All critical indicators relate to project populations. Indicators in bold are determined in the KAP survey. The other indicators are tracked on a month-to-month basis.

## **Oral Rehydration**

1. Number and % of CHWs teaching ORS/ORT.
2. Number and % of mothers demonstrating correct preparation and administration of pre-packaged ORS.
3. Number of village health education sessions on diarrheal disease, dietary management of diarrhea, dehydration and ORT given in a six month period of time.
4. Number and % of children under five with diarrhea in the past two weeks who were given appropriate treatment.

## **Immunization**

1. Number and % of CHWs teaching about the need for complete immunizations.
2. Number and % of children under 12 months having received the third DPT.
3. Number and % of children under 12 months having received the third Polio vaccine.
4. Number and % of children under 12 months having received the Measles vaccine.
5. Number and % of children under 12 months having received BCG.

## **Nutrition**

1. Number and % of CHWs teaching infant and child feeding practices.
2. Number and % of CHWs teaching prenatal, postnatal and family nutrition.

## **Growth Monitoring**

1. Number and % of CHWs teaching growth monitoring.
2. Number and % of CHWs correctly weighing children under three years in their villages.
3. Number and % of CHWs correctly recording the weights of children under three in their villages.
4. Number and % of children showing standard growth progression over a three year time-frame.
5. Number and % of mothers who can describe the meaning of the growth charts.

## **Breastfeeding**

- 1.. Number and % of infants being solely breastfed to the age of four months.
- 2.. Number and % of mothers introducing nutritious weaning foods to their babies at the age of four months.
3. Number and % of CHWs referring women with breastfeeding problems to Breast is Best (BIB) breastfeeding counsellors.

## **Acute Respiratory Disease**

1. Number and % of CHWs who can correctly describe mild, moderate and severe ARI.
2. Number and % of mothers who can correctly describe symptoms and treatment of mild respiratory infections.

## **Family Life Education**

1. Number and % of CHWs able to describe child spacing methods in basic terms.
2. Number and % of CHWs referring villagers to BFLA.
3. Number of Women referred during the preceding 6 months.

## **KAP SURVEY METHODOLOGY.**

### **Survey questionnaire development.**

The survey questionnaire was adapted from the questionnaire used in the 1987 KAP survey for MACH 1. It was developed by a previous consultant in March/April 1987. KAP surveys developed for other major child survival projects worldwide were collected and examined. In Belize, survey input was received from MOH and PVO representatives. Questions for the survey were analyzed and discussed with the two CARE CHOs in Corozal to gain their input on local responses and appropriate Spanish.

As this survey questionnaire had already been used for the MACH 1 KAP baseline survey, it was necessary to use the same instrument with some modifications. Questions which were to be asked in the MACH 2 KAP survey that were asked in the first survey were left unchanged. Additional questions were reviewed with the MACH Project Manager and, the USAID PVO Health Projects Manager, and the Director of Primary Health Care, among others. The revised survey went through many revisions based on comments of the above persons, and on review by the CHOs of the CARE staff. This revised version was used during the pre-testing.

The pre-testing was conducted in the village of Caledonia, a MACH 2 village but not one which was part of the sample for the survey. Excellent results were obtained from the pre-testing regarding the flow and comprehension of questions. Clarification needs were identified. A final version of the survey instrument was produced based on the pre-test. The MOH received a copy of the revised survey for approval. This final version was used during the interviewer training and, after question numbering was modified, during the actual survey.

### **Reference population and Sampling design.**

The villages selected for the KAP survey were all group C villages (total = nine). These villages joined the project in January 1989 and were selected to be used for the baseline KAP survey because little intervention, specifically the training of CHWs, had been accomplished at this point. Sampling was done from a list of individuals in the population to be studied, mothers with children under five years old. The number of mothers per village with children under five years old ranged from 8 to 202. This census of mothers was obtained by the CHWs from the village, who were trained by the project in obtaining the census and in mapping the village. This census was comprehensive in that no mother of a child under five years old was excluded. A sample size of 25% of eligible women was surveyed in each village. The criterion for inclusion in the sample was that the mother had to have at least one child under five years old. Simple random sampling was the sampling method used to select prospective respondents. In nine villages were used in selecting the sample, all women

with children under five years old were listed and 25% of all these women in each village were selected.

The design for this type of survey is a one group pre-test post-test (OXO) design. This design, while being simple, and having known threats to validity, is useful when assessing knowledge, skills, and attitudes.

During the pre-test, reliability and validity checks were done to increase validity. Maximum control was exerted over the quality of the instrument and the data collection process.

To compensate for the inherent threats to validity, significant effort will be made to control for historical and maturation effects when the post-test is done. In the post-test, attention needs to be focused on the validity threat of regression, as well as the other threats of history and maturation.

### **Selection of interviewers.**

Interviewers were selected by the MACH Project Coordinator. Criteria for selection were 1) ability to speak Spanish and English, 2) residence in Corozal or Orange Walk Districts, 3) maturity, 4) flexibility of schedule, allowing them to take the time off to participate, and 5) female. Women with experience in interviewing were preferred.

Initially, interviewers who had participated in the MACH 1 KAP survey were approached. These were women who were enrolled at the Belize Teachers College at the time. However, these women were unavailable.

The second choice was the School of Nursing where it was hoped that rural nursing students would be available as interviewers. These women were also unavailable.

Finally a group of ten women was selected from the Orange Walk and Corozal Districts. These women were Red Cross volunteers, CHWs with the MACH 1 project, and one retired rural health nurse. Six were from Orange Walk District, and four were from Corozal District. All met the criteria for selection and two had previous experience as interviewers.

### **Interviewer Training**

The interviewer training was conducted over three days by the MACH Project consultant, with some topics presented by the two District Trainers, the Technical Advisor, and the Project Coordinator. (See Appendices, Interviewer's guide.)

Participants for the three day training were the ten women selected to be interviewers. On the first day of training, all Community Health Organizers, and the Principal Trainer of the MOH were present in addition to the above mentioned speakers.

The participants were given packets consisting of a clipboard, two pencils, an identification card, a copy of the survey questionnaire, an ORS packet, a Growth Card, a copy of the training agenda, a copy of the interviewer's guide, and information on the MACH project and CARE.

Teaching techniques used during the interviewer training involved lectures, role play, questions and answers, practical experience and discussions. The rationale for the KAP survey was discussed as were the key points to the success of a survey, such as good interviewing techniques. Logistics of the survey were reviewed, including reading the maps, and locating the homes.

The questionnaire was reviewed question by question, with role play activities for some of the questions. When this review was accomplished the participants practiced interviewing techniques and filling out the questionnaire using a role play activity. The women divided up into pairs with one person acting as the mother, and the other person playing the role of the interviewer. The interview was then conducted, with the introduction being practiced also. After the "interview" was finished, the consultant reviewed the survey questionnaires for errors in completion, and discussed results and answered questions individually with the participants who had conducted the practice interview. The participants then switched roles, with the person who had played the mother now being the interviewer. The participants practiced interviewing with a partner three times. After this exercise the participants expressed confidence in their ability to conduct interviews with mothers in the village.

Practice interviews took place in the village of Chan Chen. Participants met in Corozal then were transported via two vehicles to the village. At Chan Chen, the interviewers were given maps of the village and given a review on how to read the maps and locate the houses. Households used for the practice interviews were selected for proximity. All were to have a mother with a child under five years old. A list of women with children under five years old was supplied by the CHWs of this village. After receiving a household to interview, the interviewer wrote the mother's name and house number in pencil on a questionnaire then set out to do the practice interview. When they had completed their first interview, they returned to where the supervisors were stationed and check in with one of the two supervisors. The supervisor looked over the survey questionnaire for mistakes or incompleteness. After conducting two practice interviews, the women returned to Corozal and their impressions and comments on their experience were discussed.

## **Conduct of the Survey**

The survey interview schedule was developed with a five day period to visit all nine villages, and 2 days allowed for returning to villages to revisit households missed during the first interview attempt. Actually, all villages were visited by the fourth day of interviewing, and the fifth day was used to revisit the villages which had households that were missed the first time the village was visited.

The survey team travelled in two vehicles. The survey team consisted of the ten interviewers, two supervisors (the consultant and the MACH project Technical Advisor), and one driver. When economical and feasible the team would split up with a group of interviewers going to a different village. This was especially effective when small villages were to be visited where only three interviews were needed. Each group was accompanied by a supervisor.

After reaching a community, the team would locate a central spot such as the village center, or near a school, and make this spot the base from which the team operated. Each community had been mapped and these maps were distributed to the interviewers. Names of women who were to be interviewed were selected by the following process:

- 1) Slips of paper had been prepared with all of the names of women with children under five years old and their house number written on them.
- 2) These slips were put into a bowl, and intermixed.
- 3) The interviewer would draw a slip of paper from the bowl and record the name and house number drawn.
- 4) The interviewer would locate the house on the map, then set off to do the interview by foot, or in the vehicle if the house was far.

Each household was selected in this manner.

If an interviewer went to a house and no one was home or the mother was unable to be interviewed, the interviewer would try to find out when the mother would be home and a return visit would be scheduled if possible. The interviewer would attempt to revisit the mother at a later time. If, after three attempts, no interview was achieved an alternate household was chosen. An alternate was also chosen if the mother did not meet respondent specifications (ie: no children under five years old), was disqualified because she was a CHW, or if she outright refused the interview. Each of these above situations where an alternate had to be selected was encountered during the interviews process.

When the interviewer completed an interview she would return to the base and give her completed questionnaire to a supervisor. The supervisor would then review the questionnaire for completion errors. When finished reviewing the questionnaire the supervisor would have the interviewer select another slip of paper with a name and house number, and following selection, the interviewer would set off to the next household. Breaks were allowed as the interviewers requested, but most preferred to continue working. A lunch break was allowed. The day was finished usually between 4:00 and 5:00 pm. Interviews were conducted in Spanish except when English was the primary language spoken.

Problems were inevitably encountered during the conduct of the survey. In most villages the following problems were found in locating the houses: 1) the maps were inaccurate, 2) the names of some of the women were wrong, 3) the women wasn't the mother of a child under five years old.

Another difficulty experienced during the conduct of the interviews was with the distances between houses. Some houses were far from the villages, and it would take 20 minutes or more to reach them. To correct this, houses were located on the map and if seemed far, the interviewer was brought to the house by vehicle. In Fire Burn problems with transportation were encountered. Despite the vehicle having four wheel drive, it got stuck in mud twice and had to be extricated with help. The vehicle was unable to reach one house which was very far away, and the interviewer and the supervisor had to walk by foot for more than a mile to reach the household. The interviewer wore high heels, yet remained cheerful throughout the ordeal, and the interview was achieved.

In one village, San Jose Nuevo Palmar, only half of the attempted interviews were accomplished because of a village meeting being held on that day.

## FINDINGS FROM DATA ANALYSIS

The analysis of the KAP survey will be largely descriptive and the information generalized across villages for planning and monitoring project activities. Some villages should be reviewed on a village specific basis due to their differences from other villages.

Certain influential factors in the MACH 2 project need to be considered when looking at the data obtained from this survey. These factors are:

- 1. Activities of other organizations.** Some villages had received some type of health intervention by organizations other than CARE. Some villages have Peace Corps volunteers, and visits from missionaries. Some activities, but not all, performed by these two groups is health related, such as the building of latrines. Guinea Grass had experienced participation by the group Amigos De Las Americas in ORS preparation and use. Patchakan had received child survival training by Child Alive, an activity of the Red Cross. These interventions can cause a reverse effect with higher responses on knowledge, attitude and practice at baseline than on post-test if the interventions were extensive prior to the survey.
- 2. Stage of development within the project.** The MACH 2 project villages have different stages of development. Project implementation began in 1988 and the villages were added at varying times. While a baseline survey should ideally begin before project activity commences, in reality and in this case this was not possible for this survey. All nine of the villages included had selected CHWs and all of the CHWs had completed training on census and map making of their villages. Some villages had CHWs with more training than others. The training is represented by the chart in the appendix. No village meetings with health education took place prior to the survey except for the village of Xaibe. Training of the CHWs in child survival topics continued during the survey, but this training of the CHWs is unlikely to affect the knowledge, attitude or practices of the women in their villages.
- 3. General village development.** Some villages are more developed than others. Some had clinics, adequate transportation, electricity and a variety of other resources. These villages would differ from smaller villages that had little or no resources such as electricity and access to transportation.
- 4. Mass media health campaign.** A mass media campaign conducted by CARE as part of the MACH 1 project had been taking place since November 1987 disseminating health messages on TV about various child survival topics such as weaning foods, ORT preparation, growth monitoring, breastfeeding, and family planning. The knowledge, attitudes and practices the mothers have may be in part due to this mass media campaign. Almost every village has a TV, even if there is no electricity available; they get power from generators run off of car batteries. At the time of the survey the media campaign had recently ended. In addition to the TV spot announcements, 1988 and 1989 calenders containing health messages were produced and distributed to CHWs and members of project villages, all primary schools in the Northern districts, and MOH and other government and non-government agencies where large numbers of people might see them. Once again a reverse in knowledge, attitude and practices may occur by the time of the post-test.

**5. Communication.** As the MACH project expands, and more CHWs are trained, there is bound to be communication among villages about the actions and interventions taking place. Women gather together at markets, fairs, and inter-village football games and discuss the current happenings in their villages. Information on child survival topics may be spread through these sources. While this is a welcome outcome of health education, women passing along the health message to other women, it may also create a high rate of knowledge about child survival topics.

These factors and others must be considered when the post-test measurement is done. At the time of post-test additional information is needed regarding the involvement of outside organizations, such as missionaries, Peace Corps, and other PVO activities, additional media campaigns, and any GOB interventions that could contribute to history and maturation effects and could influence the internal validity of the project. MACH should be at the forefront in documenting interventions, both positive and negative, that may occur during the project period.

**Description of sample.**

The villages selected for the MACH 2 KAP survey had a population of women with children under five years old that ranged from 8 to 202. A sample size of 25% of eligible women were surveyed in each village. The criterion for inclusion in the sample was that the woman interviewed was the child's mother and that she had to have at least one child under five years old. A non-random cluster design was used with simple random sampling within the clusters. All nine villages were used in selecting the sample, all women with children under five years old were listed and 25% of all these women in each village were selected.

Table 1.1 represents the number of women interviewed by the village and district.

	<b>COROZAL</b>
CONSEJO	2
PATCHAKAN	23
SARTENEJA	22
XIABE	23
<b>TOTAL</b>	<b>70</b>
	<b>ORANGE WALK</b>
CARMELITA	6
EBENEZAR (FIREBURN)	3
GUINEA GRASS	51
SAN JOSE DE PALMAR	16
TOWER HILL	4
<b>TOTAL</b>	<b>80</b>
OVERALL TOTAL INTERVIEWED = 150	
TOTAL USED IN ANALYSIS = 149	

The nine villages where the KAP survey was conducted are distributed throughout Orange Walk and Corozal Districts. Some are near the highway and have better access to transportation, communications and other services. Others villages are more isolated and are more self-contained. These villages may not have simple services such as electricity, or adequate water supply. Most of the people are Mayan or Mestizo, although some villages consist of English speaking Creoles. The primary occupation of the men is cane farming, milpa farming and fishing. Most of the women are housewives and stay at home, although some are teachers and store clerks. Many women are involved in some type of women's group such as a church group or a women's sewing group. All of the villages, even the very isolated Fire Burn, have primary schools, and one or more churches. The prevalent religious faiths are Catholic, Seventh Day Adventist, and Pentecostal. Two political parties exist in Belize, the People's United Party (PUP), and the currently in power United Democratic Party (UDP). An election is expected later in this year.

In the past, the population in Belize had been relatively stable. However, in recent years there has been an influx of refugees from neighboring countries experiencing economic or political strife. Some villages have larger refugee or alien populations than others, particularly Fire Burn.

Another factor in demographic changes is the decline of sugar cane on the world market causing an economic decline in the two districts. The Libertad cane factory in Corozal district closed in 1985, but at the time of the survey was in the process of reopening as a functioning factory producing industrial grade alcohol. The decline continues however, and may be causing an exodus from the region, however no statistics support this as yet. Some of the houses visited had been deserted with the family having moved to "The City". Observance of economic trends, especially those affecting the sugar cane industry should be made between this pre-test and post-test.

### **Survey results.**

The analysis uses very small numbers, with a sample size of 149 households, divided proportionally within the villages. In the smallest village, only two households were interviewed, and in the largest, 51. It may be difficult to generalize from the survey results as misleading interpretations can occur due to the small numbers. However, basic information on program indicators can be useful for program planning purposes.

The KAP survey was divided into six major sections and these sections will be discussed in the following order.

1. General Information.
2. Pregnancy, Childbirth, and Breastfeeding.
3. Diarrhoeal diseases
4. Family planning
5. Acute Respiratory infections
6. Immunization

Percentages will be rounded when reporting the data. Data are reported according to specific topics, although a listing of frequencies and averages of all fields are included in the appendix.

Percentages that total more than 100% are the result of multiple response questions. Percentages are based on the actual number of responses to each individual question, except when stated otherwise. Occasionally, missing values were encountered. When this occurred, the overall % was calculated to the number of values, not to 149.

Results reported in this section reflect mostly those pertaining to the project indicators.

### 1. General information.

The total number of women interviewed was 150 and the total number of questionnaires used in the analysis was 149. One survey questionnaire from Sarteneja in Corozal district was rejected during the analysis stage because the child was handicapped and didn't reflect the general population. Because of the small sample, it was felt that the results from this questionnaire could skew the overall results.

Maternal level of education is an important indicator of child health. It has been demonstrated by research worldwide that as the mother's education improves so does her children's health. While the majority of mothers interviewed had received some level of schooling, nine percent had never received any schooling at all. This result is similar to that of the MACH 1 survey which was 7%. All villages now have a primary school, so it is expected that children are receiving at least a primary level of education. Table 1.2 shows the level of mother's education by district.

**TABLE 1.2  
LEVEL OF EDUCATION OF WOMEN IN COROZAL DISTRICT**

	NUMBER	PERCENT
NEVER WENT	2	3
SOME PRIMARY	31	45
COMPLETED PRIMARY	30	43
SOME SECONDARY	4	6
COMPLETED SECONDARY	2	3
TOTAL	69	100

**LEVEL OF EDUCATION OF WOMEN IN ORANGE WALK DISTRICT**

	NUMBER	PERCENT
NEVER WENT	12	15
SOME PRIMARY	30	38
COMPLETED PRIMARY	30	38
SOME SECONDARY	3	4
COMPLETED SECONDARY	3	4
TOTAL	78	100

Note: Percentages are calculated to district totals not overall totals.

When asked about health problems affecting their children under five years old within in the last month, the most frequent response was some type of respiratory illness. This reflects the PAHO/WHO report that Acute Respiratory Infections(ARI) accounted for 20.8% of infant and child mortality in 1987, making it the leading cause of infant mortality in Belize. Another health problem that occurred frequently was fever. While fever is not specific to a single illness, it could relate to ARI. Although only one response of malaria was given, the response of fever could also reflect incidence of malaria. This would be significant in that malaria is on the increase in Belize, especially Corozal district. Responses of diarrheal disease also occurred frequently; reflecting it's status as the second leading cause of infant and child mortality in Belize.

Table 1.3 shows the frequency and percent of the health problems affecting their children under five years old within the last month. There were multiple responses allowed for this question.

Twenty-eight (19%) of the women responded that no health problems affected their children under five years old within the last month.

**TABLE 1.3**  
**HEALTH PROBLEMS AFFECTING CHILDREN UNDER FIVE YEARS OLD**  
**WITHIN THE LAST MONTH**

	NUMBER	PERCENT
COLDS	78	52
FEVER	55	37
BRONCHITIS	15	10
DIARRHOEA	15	10
COUGH	6	4
VOMITING	5	3
SKIN INFECTIONS	3	2
SORE THROAT/THROAT INFECTION	3	2
HEPATITIS/JAUNDICE	1	0.7
MALARIA	1	0.7
MEASLES	1	0.7
EARACHE	1	0.7
DIZZINESS	1	0.7
CUT FINGER	1	0.7
STOMACH ACHE	1	0.7
DARK YELLOW URINE	1	0.7
HEADACHE	1	0.7

When asked about the most serious health problems in the family the responses once again indicated that some type of respiratory illness was the major problem. Fever once again had a high frequency of responses. There were multiple responses allowed for this question.

Table 1.4 shows the most common health problem in the family. There were multiple responses to this question.

**TABLE 1.4**  
**HEALTH PROBLEMS AFFECTING THE FAMILY WITHIN THE LAST MONTH**

	NUMBER	PERCENT
COLDS	100	67
FEVER	69	46
DIARRHOEA	12	8
BRONCHITIS	9	6
COUGH	5	3
SORE THROAT	4	2.7
EARACHE	2	1
SKIN INFECTIONS	2	1
VOMITING	2	1
MEASLES	1	0.7
FITS/ATTACKS	1	0.7
BODY PAIN	1	0.7
ANAEMIA	1	0.7

Seven women (5%) stated that they had no major health problems in their family within the last month and three women responded that they didn't know what the major health problems of their family were.

## 2. Pregnancy, Child birth and Breastfeeding

It is a MOH goal and a common concern whether mothers are going for at least one pre-natal visit. Almost all of the mothers (140 or 94%) consulted someone during their last pregnancy, but less than half (64 or 43%) consulted someone within the first trimester, which is a crucial time for the fetus. Mothers need to be encouraged to go for consultation earlier in their pregnancies, as soon as they suspect they are pregnant. Results from the MACH 1 survey were similar; over 96% of the mothers went for at least one prenatal examination, and 31% sought care in the first trimester. In the next KAP survey a question to obtain information on the number of pre-natal visits a mother makes will be asked.

It was believed by the survey consultant that the time in pregnancy when a mother reports for her first consultation would be dependent on whether it is her first or later pregnancy. It was hypothesized that with the first pregnancy and the later pregnancies, after four or more children had been born, that women are more likely to seek consultation earlier than pregnancies after the first born. It was found during analysis that the number of children that a woman has does not significantly influence when she reports for her first consultation.

Table 2.1 shows a crosstabulation of months pregnant versus the number of children a mother has. Months pregnant at first consultation was calculated to the mother's last pregnancy.

**TABLE 2.1**  
**NUMBER OF MONTHS PREGNANT WHEN WOMEN FIRST SOUGHT CONSULTATION**  
**BY NUMBER OF CHILDREN**

# OF CHILDREN	MONTHS PREGNANT			TOTAL
	1-3	4-6	7-9	
1	6	9	1	16
2-3	28	21	1	50
4-5	7	19	2	28
6-7	16	8	1	25
8-9	4	7	2	13
10+	3	2	0	5
<b>TOTALS</b>	64	66	7	137

While 123 (83%) of the women responded that they had received at least one tetanus injection during their pregnancy, only 80 (54%) have knowledge why tetanus injections are recommended for women. The women who had not received tetanus injections during their last pregnancy may have been covered from previous pregnancies. Results from the MACH 1 survey found that 79% of the mothers interviewed received at least one tetanus injection during their last pregnancy, but only 37% knew why tetanus injections are recommended. This increased knowledge of mothers on why tetanus injections are recommended may be due to better education provided by the persons giving the injections, which is usually done in the clinics, media campaigns, and general diffusion of knowledge gained by interaction by the MACH 2 village women with mothers and CHWs of MACH 1 villages.

Studies on breastfeeding worldwide show that fewer women are breastfeeding, and the ones who are breastfeeding are doing so for a shorter period of time. Of the women interviewed only 66 (44%) had breastfed their youngest child. This number is very low considering that a previous KAP baseline survey done for MACH 1 indicated that 96% breastfed their youngest child. This low number may be due in part to the development of the villages where the survey was conducted. Two of the villages, Guinea Grass and Sarteneja have large populations and are developed in the sense that they have abundant resources such as electricity, adequate transportation and communication systems. Several villages, San Jose Nuevo Palmar, Patchakan, and Xaibe are located close to the major towns of Corozal and Orange Walk. The women from these villages may have adopted more "western" customs including bottle feeding practices for their infants.

Another explanation for the low number of women who breastfed their youngest child is a combination of two factors. Many Mestizo women have the cultural belief that there are certain foods that

woman can't eat while breastfeeding. Faced with these beliefs, and the availability of inexpensive bottle formulas in nearby Mexico, women may be opting to bottle feed their infants rather than make the food sacrifices that their culture requires. Further investigation may be needed to explain the differences between the two results of the KAP surveys.

Breastfeeding policy in Belize is to encourage breastmilk only or "puro pecho", which signifies total breastfeeding, giving no other foods, for the first four months of a child's life. Of the women who breastfed their youngest child, 54% or 31 gave their child breastmilk only for four months or longer. Overall, the number of women who solely breastfeed their infant four months and longer is only 31, or 22% out of all mothers interviewed (excepting those who were currently breastfeeding; they weren't included in the sample because it wasn't known how long they would breastfeed their infant.)

Table 2.2 shows how long breastmilk only was provided by the number of children.

**TABLE 2.2  
CHILDREN SOLELY BREASTFED  
BY SPECIFIED LENGTH OF TIME**

LENGTH OF TIME	NUMBER OF CHILDREN	% OF CHILDREN
LESS THAN ONE MONTH	8	13
1-2 MONTHS	18	31
3-4 MONTHS	14	24
MORE THAN 4 MONTHS	17	29
NEVER	2	3
UNTIL NOW*	6	*
<b>TOTALS</b>	<b>65</b>	<b>100</b>

\* Six mothers were still breastfeeding at the time of the survey, and were not included in calculating the percentage because it wasn't known how long they would be giving breastmilk only.

Weaning foods are an important child survival issue. In Belize it is suspected that mothers are weaning their child at the wrong time, either too early or too late, or are giving them non-nutritious weaning foods. Evidence that supports this is the incidence of malnutrition is 8% in the 0 to 1 age group but jumps to 20% in the 0 to 4 age group.

Belize encourages weaning from the family pot, introducing one food at a time. Weaning foods are recommended to be given to the child at the age of four months. Only 33(22%) of women surveyed began to give their child weaning foods at four months.

Table 2.3 illustrates the first weaning foods given to a child at four months.

<b>FOODS</b>	<b>NUMBER</b>	<b>PERCENT</b>
<b>OTHER MILKS</b>	11	33
<b>POTATOES</b>	7	22
<b>PORRIDGE/CORNMEAL</b>	4	12
<b>SOUP</b>	4	12
<b>BISCUITS</b>	3	9
<b>WATER</b>	2	6
<b>JUICE</b>	1	3
<b>DOESN'T REMEMBER</b>	1	3
<b>TOTALS</b>	33	100

Six women hadn't started giving weaning foods yet because they were still breastfeeding their baby. Other foods given, but not at four months, were custard, coffee/tea, tortillas, Gerber baby foods and fruits.

Growth monitoring is another key child survival issue. Although most women (144 or 97%) had seen the growth chart card before, fewer knew what the growth chart means.

Table 2.4 shows the responses to the question of what the growth chart means. There were multiple responses allowed for this question.

The women who gave vaccination as a response to the question on the growth chart card aren't entirely incorrect; the child's vaccinations are recorded on the card, but for project monitoring purposes, vaccinations is an incorrect response.

	<b>NUMBER</b>	<b>PERCENT</b>
<b>HOW WELL CHILD IS GROWING</b>	33	23
<b>IF CHILD IS GAINING/LOSING WEIGHT</b>	79	55
<b>ABOUT VACCINATIONS</b>	28	19
<b>DOESN'T KNOW</b>	35	24
<b>DATE WHEN TO RETURN TO CLINIC</b>	2	1
<b>FOODS YOU SHOULD GIVE THE CHILD</b>	1	0.6
<b>ABOUT CHILD'S HEALTH</b>	1	0.6

### 3. Family Planning.

According to a 1987 report on health and development in Belize, the fertility rate is 5.4 which is three times higher than most other Caribbean nations. The growth rate of Belize is a moderate 2.6%, but with the high birth rate of 3% per year, a declining death rate of 4% per year and decreased emigration, it is expected that a much more rapid population growth will occur in the future

Family planning services are not readily available to women living in the rural northern district of Belize. The Belize Family Life Association, which provides organized family planning services in Belize, hasn't yet opened a clinic in the northern districts, although they plan to soon.

This lack of access to family planning services may be why only 67 women (45%) interviewed had sought advice about family planning. Even less, only 46 (31%) actually use a birth control method. This result is similar to that of the MACH 1 survey, where 28% of the women interviewed said that they used a method to prevent pregnancy.

Women sought family planning advice from a variety of sources. Because some women are living close to Mexico, were asked if they sought advice in Belize or Mexico.

Table 3.1 shows the facility or source where they sought advice and whether it was in Belize or Mexico. There were multiple responses for this question.

**TABLE 3.1**  
**SOURCE/FACILITY WHERE WOMEN SOUGHT FAMILY PLANNING ADVICE**  
**BELIZE OR MEXICO**

SOURCE/FACILITY	NUMBER	
	BELIZE	MEXICO
DOCTOR	19	5
NURSE	13	2
CLINIC	13	1
HOSPITAL	6	2
FAMILY MEMBERS	7	-
FRIENDS/NEIGHBOR	3	-
PRIVATE COUNSELLOR	2	-
CHURCH	2	.
TELEVISION	2	-
RADIO	1	1
MIDWIFE	1	-
SCHOOL	1	.
NEWSPAPER	1	-
NOBODY(HERSELF)	1	"
HUSBAND	1	-
BOOK	1	.
TOTALS	74	11

It is interesting that eleven women sought advice in Mexico rather than in Belize. This may reflect that women are finding family planning services difficult to obtain. This needs to be explored in greater depth.

After receiving advice about family planning not all women follow up and seek family planning services. Five women(7%) didn't go on and seek services after receiving advice.

When women do seek services Table 3.2 indicates where they go, again in Belize or Mexico. Multiple responses were allowed for this question.

**TABLE 3.2**  
**SOURCE/FACILITY WHERE WOMEN SOUGHT FAMILY PLANNING SERVICES**  
**BELIZE OR MEXICO**

SOURCE/FACILITY	NUMBER	
	BELIZE	MEXICO
PHARMACY	18	5
DOCTOR	16	1
CLINIC	8	3
HOSPITAL	3	3
BFLA	1	-
TOTALS	46	12

One woman went to Guatemala to receive her family planning services.

Table 3.2 indicates that women either do not know about BFLA, or aren't being referred there. As mentioned previously, BFLA will be expanding its services to the northern districts soon. It is interesting to see that 23 women received their services from a pharmacy. It isn't known if pharmacists are giving any health education messages to women regarding family planning or if they are simply dispensing medicines.

Of the women who sought family planning services 68% (46 total) use pregnancy prevention methods.

Table 3.3 shows the methods these women use (next page).

**TABLE 3.3**  
**MODERN FAMILY PLANNING METHODS USED TO PREVENT PREGNANCY**  
**BY WOMEN WHO SOUGHT FAMILY PLANNING SERVICES**

METHOD	NUMBER	PERCENT
PILLS	26	56
INJECTION	13	28
TIE OFF	4	9
IUD/COIL	3	7
<b>TOTALS</b>	<b>46</b>	<b>100</b>

Other sources of information indicate that many women prefer to use the injections because they are given about once every three months, and their husbands don't know they are using a family planning method. Surprisingly, no women claimed to use condoms or natural methods to prevent pregnancy.

#### **4. Diarrheal Disease.**

In Belize, diarrheal disease is the second leading cause of death in both infants and in children. The questions asked of mothers about their child's diarrhea focused on the incidence of diarrhea within the last three months, how the diarrhea was treated, beliefs about causes, feeding practices and use of pre-packaged ORS. No specific questions were asked about homemade solutions as it is the national primary health care policy to encourage the use of pre-packaged ORS.

Survey interviewers gave mothers a specific definition of diarrhea: three or more loose or watery stools within a 24 hour period.

Questions were directed first to any child under five who had had an incidence of diarrhea within the last two weeks. If no children had had an incidence of diarrhea within the last two weeks, the mothers were asked when was the last time their child had diarrhea. Any responses beyond three months were excluded from further questioning about practices during the episode.

Of the mothers interviewed, 27% (40 total) had a child with an incidence of diarrhea within the last two weeks. This result is similar to the incidence of diarrhea in the last two weeks reported in the MACH 1 survey, which was 23% (36 total).

A total of 42% (63 total) of the mothers reported an incidence of diarrhea within the three month recall period. In MACH 1 the response to this question was almost identical at 43% (63 total).

Table 4.1 shows a breakdown of the incidence of the most recent episode of diarrhea by time period. (next page)

**TABLE 4.1**  
**INCIDENCE OF THE MOST RECENT EPISODE OF DIARRHEA**  
**BY TIME PERIOD**

TIME PERIOD	NUMBER	PERCENT
LESS THAN 2 WEEKS AGO	40	27
2 TO 4 WEEKS AGO	4	3
1 TO 3 MONTHS AGO	19	13
3 MONTHS TO 1 YEAR AGO	27	18
MORE THAN 1 YEAR AGO	32	21
CHILD NEVER HAD DIARRHEA	18	12
DOESN'T REMEMBER	9	6
<b>TOTALS</b>	<b>149</b>	<b>100</b>

The major cause of death when a child has diarrhea is dehydration. It is estimated that since the introduction of ORS to combat dehydration, thousands of children's lives have been saved. It is, therefore, important that a mother knows to give ORS for dehydration, how to administer the pre-packaged ORS and how much to give the child.

When a child has diarrhea, often the mother will give something to treat it.

Table 4.2 indicates what the mother gave the child to treat the diarrhea.

**TABLE 4.2**  
**TREATMENT GIVEN BY MOTHERS TO CHILDREN**  
**WITH AN INCIDENCE OF DIARRHEA**

TREATMENT	NUMBER	PERCENT
PILLS	8	13
SYRUP	13	20
LAXATIVE	1	2
PURGE	5	8
HERBS AND WATER	5	8
HOMEMADE SOLUTION	1	2
ORS	5	8
PEDIALYTE	1	2
PEPTO BISMOL/KAOPECTATE	11	17
GRIPE WATER/ALKA SELTZER	7	10
OTHER	7	10
<b>TOTALS</b>	<b>64</b>	<b>100</b>

One flaw with the information collected on treatment of diarrhea is that it doesn't address how the mother treated dehydration.

When asked if they recognized the ORS packet, 77%, or a total of 114, of the mothers surveyed responded that they recognized it. Only 19.4% (26 total) knew that it was used to treat dehydration, however, a high 62% (84 total) believed that it was used to treat diarrhea, which, in the experience of the survey consultant, seems to be a common belief among many village women. A high 58% (87 total) of the mothers surveyed knew the correct preparation of the ORS: mixing it in one liter of water.

But the percent who knew the correct administration of ORS to a child in 24 hours dropped to only 22% (33 total).

## 5. Acute Respiratory Infections

Acute Respiratory Infection (ARI), is the leading cause of death for Belizean infants and children. The questions asked of mothers about ARI were similar in content to those asked about diarrhea, with a focus on the incidence of ARI within the last three months, how both mild and severe ARI are treated, and beliefs and feeding practices during an episode of ARI.

Survey interviewers gave mothers a definition of ARI: any disease such as coughs, colds, flu, bronchitis, asthma or similar illness.

Questions were directed first to any child under five who had had an incidence of ARI within the last two weeks. If no children had had an incidence of ARI within the last two weeks, the mothers were asked when was the last time their child had an incidence of ARI. Any responses beyond three months were excluded from further questioning about practices during the episode.

Incidence of ARI was high. Of the mothers interviewed, 104 (70%) had a child with a case of ARI within the last two weeks. This is nearly double the result of 42% (67 total) for this question reported in the MACH 1 survey. An explanation for this difference could be seasonal, affected by the time of year when the surveys were conducted. The survey for MACH 1 was conducted in the month of July, when the weather is hot and rain is frequent. In February, the weather is cooler, although the rains are less frequent.

A total of 124 (83%) of the mothers reported an incidence of ARI within the three-month recall period. This is closer to the MACH 1 report of 72% for an incidence of ARI within the three-month recall period.

Table 5.1 shows a breakdown of the incidence of the most recent episode of ARI by time period. (next page)

**TABLE 5.1  
INCIDENCE OF THE MOST RECENT EPISODE OF ARI  
BY TIME PERIOD**

<b>TIME PERIOD</b>	<b>NUMBER</b>	<b>PERCENT</b>
LESS THAN 2 WEEKS AGO	104	70
2 TO 4 WEEKS AGO	8	5
1 TO 3 MONTHS AGO	12	8
3 MONTHS TO 1 YEAR AGO	11	7
MORE THAN 1 YEAR AGO	7	5
CHILD NEVER HAD ARI	2	1
DOESN'T REMEMBER	5	4
<b>TOTALS</b>	<b>149</b>	<b>100</b>

Duration of ARI cases is reported in Table 5.2. This table represents both the ARI cases that have been resolved and the cases that were ongoing at the time of the study.

**TABLE 5.2  
DURATION OF ARI CASES WITHIN THE LAST 3 MONTHS  
MACH 2**

<b>DURATION</b>	<b>NUMBER</b>	<b>PERCENT</b>
1-3 DAYS	13	10
4 TO 6 DAYS	19	15
1 TO 2 WEEKS	32	26
2 WEEKS OR MORE	12	10
HAS ARI NOW	48	39
<b>TOTALS</b>	<b>124</b>	<b>100</b>

Notice in Table 5.2 that at the time of the survey that 48 (39%) mothers responded that their child had an ongoing case of ARI. Duration of ARI cases were generally less in MACH 2 than in MACH 1.

A project indicator is whether mothers are able to correctly identify mild and severe ARI. Mothers were prompted once by the interviewer so that they would give more than one sign or symptom if they could.

Table 5.3 shows the number and percent of mothers who were able to give at least one, two and three signs or symptom of mild and severe ARI.

TABLE 5.3 MOTHERS WHO COULD GIVE ONE, TWO AND THREE CORRECT SIGNS OR SYMPTOMS OF MILD ARI		
	NUMBER	PERCENT
ONE SIGN	129	87
TWO SIGNS	61	41
THREE SIGNS	13	9

MOTHERS WHO COULD GIVE ONE, TWO AND THREE CORRECT SIGNS OR SYMPTOMS OF SEVERE ARI		
	NUMBER	PERCENT
ONE SIGN	114	77
TWO SIGNS	40	27
THREE SIGNS	7	5

The number of women who knew how to correctly treat their child with severe ARI by taking him or her to the hospital or clinic for treatment numbered 121 (81%).

## 6. Immunizations

The National Expanded Program on Immunization has the objective to obtain an immunization coverage of 100% for children under the age of one year by 1991, however, immunization coverage in Belize has dropped since a national campaign in 1986. Immunization coverage in the district of Corozal has been found to be lower than the national average.

Although the health card that is used for recording vaccinations lists what the child will be immunized against, many mothers can't identify what diseases are prevented by immunization.

Table 6.1 shows the responses given for what diseases are prevented by vaccination. There were multiple responses allowed for this question. (next page)

**TABLE 6.1**  
**MOTHERS WHO CAN IDENTIFY DISEASES**  
**THAT ARE PREVENTED BY IMMUNIZATION**

DISEASE	NUMBER	PERCENT
MEASLES	93	62
SMALL POX	35	23
BCG (TUBERCULOSIS)	26	17
PERTUSSIS (WHOOPIING COUGH)	47	32
TETANUS	38	26
POLIO	27	18
DIPHTHERIA	55	37
BRONCHITIS/COLD	12	8
TYPHOID	8	5
FEVER	2	1
DON'T KNOW	21	14

As the table shows many mothers don't know what diseases are preventable by immunizations.

Available data on immunizations of children is incomplete. The interviewers asked to see the health card for the youngest child who was three months old or older. The interviewers used the child's health card to verify immunizations received and the age of the child at the time of the immunization. Although 127 (85%) of the mothers interviewed said that they had a health card for their youngest child, in 38 cases the mothers said that the card was missing, or that she had lost her child's health card. In some cases the mothers stated that the child had received complete immunizations but that the nurse had not written the immunization date of the card making the card incomplete. In seven cases the dates written on the card didn't correspond with the child's age or were wrong. Sometimes the date was written for before the child was born and sometimes the date was written for the future, as in May, 1989.

All questionnaires with questionable cards were excluded from the sample, leaving the sample of eligible cards to be only 82. This number of eligible cards differs greatly from the number of mothers who responded that their child had been immunized, which was 138 (93%).

All calculations of immunizations are based on the 82 eligible cards. When specific age groups are reported, the percent is calculated to that age group only, not to the overall population of children with eligible cards. The results of the immunization coverage show that they are far below the goal of 100% coverage.

Table 6.2 shows the percent of children fully immunized by age group. (next page)

**TABLE 6.2**  
**CHILDREN WHO ARE FULLY IMMUNIZED BY AGE GROUP**

AGE GROUP	% FULLY IMMUNIZED*
OVERALL	78
3-9 MONTHS	76
9-18 MONTHS	61
12 MONTHS	70

\* The definition of "fully immunized" is based on MACH II project immunization standards. At three months the child should have received BCG, and the first DPT the first Polio, at six months the child should have received the second series of DPT, and Polio, and at nine months they should have received their third DPT, Polio, and Measles vaccinations. Therefore, fully immunized at 9-18 and at 12 months indicates that these children had received their third DPT, their Polio, BCG and Measles vaccines.

The percent of children who received BCG injections at birth is only 50%. However, BCG immunization coverage increases after birth, with many children receiving their BCG immunizations at the time of their first DPT series of immunizations, which is usually at three months.

When reviewing the data reported here it must be remembered that this data is used small numbers and may not reflect true immunization coverage.

Possible explanations as to insufficient coverage can be made. When mothers who had not had their child immunized were asked the reasons why they hadn't they gave the following responses: three said that they didn't have enough time to bring their child to be immunized, one said that they didn't want their child immunized, one said that her child had been sick (although the child's illness should not be a contraindication to receiving immunizations), and two said that their husbands objected to having their child immunized.

An additional reason for lack of coverage may be due to inconsistent visits by the mobile clinic to villages. Although the mobile clinic is supposed to visit the villages every six weeks, it may not be coming on schedule.

Other factors relating to insufficient coverage are distance to the clinics, the health personnel at the clinics not wanting to immunize small numbers of children (preferring to have at least 10 at a time so as to not waste any of the vaccine), and generalized lack of awareness about the benefits of immunizations.

Explanations regarding the insufficient coverage were not explored during this survey but should be, at a more profound level.

## DISCUSSION

The Mach 2 project has the opportunity to make a significant impact on the lives of women and children involved in the project.

The survey results show that although the women in Orange Walk and Corozal districts have a fairly good knowledge base about child survival topics, improvement is needed in all areas. Intervention in the form of health education sessions by trained CHW's is needed to improve the mother's knowledge and practices concerning child survival topics addressed in this survey.

All personnel involved in the MACH 2 project need to be involved in a discussion of the results of the data analysis. They need to be made aware of areas that need improvement such as encouraging mothers to breastfeed, to breastfeed up until four months, to understand the growth chart card, to give nutritious weaning foods, to learn more about family planning services, to correctly prepare and give ORS when their child is dehydrated, to recognize signs of mild and severe ARI and know how to treat their children when they have a case of ARI, and to encourage mothers to have their children immunized.

Mothers receive information from a variety of sources such as doctors, nurses, pharmacists, media campaigns, and other village members. Frequently others such as doctors and nurses are seen as experts and the advice and information they give seen as indisputable. Information that they may be giving the mothers needs to be coordinated with the health messages that will be delivered by the CHWs. Otherwise the CHWs' credibility will be at stake if what they recommend differs from what the "experts" recommend.

Data collected for this survey may relate to the season of the year. It was the dry season, with some cool days and nights. The high prevalence of ARI may be related to the coolness of the weather. Fever is also a seasonal disease when it is due to mosquito-borne diseases. Dengue and malaria are more likely to increase during the rainy season, so the incidence of these diseases may rise when the rainy season begins. Diarrheal disease may also be affected by the weather. This baseline survey doesn't address seasonality.

Some differences between first KAP survey and second KAP survey were apparent.

While responses on whether mothers received at least one tetanus injection were similar in MACH 1 and MACH 2 surveys, the responses on whether the mothers have knowledge why tetanus injections are recommended are somewhat different, with 37% in MACH 1 and 54% responding in MACH 2. This increased knowledge of mothers surveyed for MACH 2 on why tetanus injections are recommended is discussed previously and are believed by the survey consultant to be related to: 1) increased education by the persons giving the injections, 2) media campaigns, and 3) general diffusion of knowledge.

Breastfeeding practices also differed between MACH 1 and MACH 2 KAP surveys. In MACH 2 only 44% of the women interviewed responded that they had breastfed their youngest child, which is quite less than the 96% reported in the MACH 1 survey. Possibilities on why these results differ so widely, which are discussed earlier in the report, are: 1) village development, with the more devel-

oped villages adopting bottle-feeding practices, 2) cultural beliefs about maternal diet during breast-feeding, 3) availability of inexpensive bottle formulas in nearby Mexico.

There is a marked difference in the results on the incidence of ARI, with an incidence of ARI within the last 2 weeks of 70% in MACH 2 and only 42% in MACH 1. A total of 83% of mothers reported in MACH 2 an incidence of ARI within the three-month recall period, which is closer to the MACH 1 three-month cumulative total of 72%. The differences between the incidence of ARI may be seasonal, due to the fact that MACH 1 was conducted in the hot, but rainy month of July, while MACH 2 was conducted in the cooler month of February.

As CARE eventually pulls out of the MACH 2 project, the MOH will assume a more active role in program planning and implementation. Planning includes the development of strong ties between MACH 2 personnel and the MOH Child Survival program and the Primary Health Care division. Problems such as the chronic rural health nurse shortage need to be discussed with the MO. Results from this survey will be shared with MOH counterparts.

## RECOMMENDATIONS

Recommendations are based on KAP survey results, discussions with MACH 2 project personnel, MOH personnel and on document review. Recommendations are numbered in order of priority to MACH 2.

1. Health education and community participation training should be given to CHWs with attention to specific needs of the target audience.

Information gathered in the section on general information included level of mother's education. While 81% of the women interviewed had received at least some primary school education, they may not have retained their ability to read. Materials and teaching strategies need to be developed for those who are unable to read.

CHWs also have the challenge of working with different ethnic groups. Most materials are already developed in Spanish, but some need to be in English as well. In some villages such as Tower Hill and Carmelita, most of the women spoke English as their primary language. As MACH 2 personnel are, with the exception of some CHWs, bilingual there should be no problem with the challenges of a bilingual population.

A survey was conducted on CHWs in the MACH 1 project on what teaching methods they used to teach villagers in village sessions. It was discovered that films and slides are popular teaching aids because more people come to village sessions. While the MACH 2 project has the equipment, including a generator, to show films and slides, this still may present difficulties since many CHWs living in villages without electricity would have to rely on borrowing the generator. Also the CHWs would need to be taught how to use such equipment. CHWs also need to learn to make and adapt local materials to make visual aids. Perhaps a session on making and using visual aids would be beneficial for the CHWs.

Other forms of traditional teaching methods that were used by CHWs and found to be popular in village sessions are role-playing, discussions, plays and demonstrations. A consideration in doing health education for village women is their ability to read.

While the CHW training manual has one module on health education techniques, additional focus needs to be on village-level teaching using participatory, interactive methods. Attention also needs to be placed on increasing the CHWs' community development skills. Health education training for CHWs is important in delivering the child survival health messages. The CHWs need to use teaching or learning techniques that are community-oriented. They need to assess the traditional forms of learning taking place in their villages such as story-telling, practical experience, demonstration, and build on these traditional forms of learning.

## 2. Focus on areas of KAP survey that need the greatest emphasis.

Use the results from the survey to identify the areas that need greater emphasis. The CHWs need to know what the selected project indicators are and how the results of the KAP survey compare to these project indicators. They also need to reinforce the positive practices that the mothers may now be doing.

Some of the areas which the CHWs should be aware of are:

- many mothers know how to mix ORS correctly but don't know how to administer it correctly.
- many mothers believe that ORS treats the diarrhea.
- while most women went for at least one pre-natal visit, less than half of them consulted someone during the first, and most crucial, trimester of pregnancy.
- fewer mothers than in the previous KAP survey done in 1987 breastfed their youngest child. This area, encouraging the mothers to breastfeed, is certainly of great importance and affords the CHWs the opportunity to make a significant impact.
- mothers lack knowledge of appropriate weaning foods and weaning practices. This is another area where the CHWs may have a significant impact.
- only 31% of women interviewed use a method to prevent pregnancy. Family planning services remain not readily available to women in the Corozal and Orange Walk districts.
- the % of children fully immunized at 12 months is 70%, which reflects the downward trend of immunization coverage since a national campaign in 1986. The CHWs can be involved in reversing this trend.

## 3. Provide for incentives, supervision and support for CHWs.

The CHWs play a vital role in the success of this project. They are unpaid volunteers working in the villages.

The CHWs can be seen as "front line" workers using health education to improve mothers KAP regarding child survival practices. These CHWs, who receive no pay for their services, need to receive adequate support and supervision, and incentive to continue with the project.

Ongoing assessment of the CHWs' knowledge and training is planned which will provide support to them as health educators. Supervision of the CHWs trained by the MACH 2 needs to be ongoing, with the responsibility shifting to the MO.

Incentives need to be given to CHWs to increase retention and continued participation with the project. Participation in workshops, and seminars would serve a two-fold purpose: increasing the CHWs knowledge and providing an incentive.

In the future the CHWs' role may be expanded to include training in other primary health care initiatives. CHWs need to be made aware of the possibility of the role expansion and have input into future training sessions and topics.

#### 4. Improve communication among MO, NCO, and MACH 2 personnel.

This is included in the planning of MACH 2 in their third level of activity. CORE committee meetings seek to increase communication by having participants discuss what is happening in the districts. The outcome of these CORE committee meetings relevant to the MACH project should be disseminated to all members of the MACH staff. Communications especially vital are health messages on immunization campaigns, health fairs, mobile clinic dates, dates when Malaria Control spraymen visit the villages, and planned national campaigns such as rabies vaccination. CHWs shouldn't be left out of the communications as they can use health messages to reinforce their own health teachings. For example, they can tell villagers "Watch for the TV spots on immunization. If you have any questions we'll answer them". Close coordination is planned with the Breast is Best League, and the Belize Family Life Association, and the Belize Red Cross. With this close coordination, duplication of services can be decreased and improved reinforcement of health messages achieved.

#### 5. Continuation of media campaign.

Although the year-long transmission of the 21 child survival message TV spots has ended, the tapes are still available and could still be shown on TV. The verbal messages that accompany the TV spots can be put on the radio, free of charge. Results of the survey done to assess the impact of the TV messages need to be reviewed for evaluation purposes. No impact assessment of the calendars has been done or is planned.

#### 6. CHWs need to collaborate with the Voluntary collaborators (VCs).

Information gathered about health problems affecting their children under five and the health problems most common in their family indicate that ARI, fever and diarrhea are major health problems. While the MACH 2 project includes diarrhea and ARI in its topics taught to CHWs, fever needs to be included in their educational sessions. It is the policy of the National Malaria Control Program that anyone with a fever see a Voluntary Collaborator (a village-based malaria worker) or the clinic and get a blood smear taken, and begin presumptive treatment. This policy was developed in response to the increase of malaria over the last few years.