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FINAL EVALUATION SURVEY  
VITAMIN A FOR CHILD SURVIVAL  
INTERNATIONAL EYE FOUNDATION  
ALTA VERAPAZ, GUATEMALA  
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Dr. Cecilia García Barrios M.D., M.Sc.

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  - \* Juan Tzimaaj Cacao
  - \* Francisco Cuc
  - \* Sebastian Tiul.
  - \* Alfonso Tzimaaj Cacao
  - \* Manuel de J. Chocoj
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  - \* Juan Caal Rey
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VITAMIN A FOR CHILD SURVIVAL PROJECT FINAL EVALUATION SURVEY  
INTERNATIONAL EYE FOUNDATION (IEF) - GUATEMALA  
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## I. EXECUTIVE SUMMARY

A Coverage, Knowledge and Practices survey (CK&P) was conducted in 20 rural villages in the province of Alta Verapaz in Northern Guatemala in August 1993 as part of the final evaluation of the International Eye Foundation's Vitamin A for Child Survival Project. This work was supported by Dr. Cecilia García Barrios, a contract consultant of the PVO Child Survival Support Program (PVO CSSP), Institute for International Programs of The Johns Hopkins University School of Hygiene and Public Health.

The objectives of the survey were to obtain information regarding the knowledge, attitudes and practices of mothers of children under two years of age concerning child survival activities, and to identify health care factors most commonly involved at the household level with childhood illnesses. The objectives of the survey were accomplished within two weeks. Results of this survey will be used to review achievement of project objectives and to provide background information for development of the Detailed Implementation Plan (DIP) for the extension of the existing project.

The Vitamin A for Child Survival Project was implemented by the International Eye Foundation, under a grant from the A.I.D. Bureau for Food and Humanitarian Assistance/Office of Private and Voluntary Cooperation (FHA/PVC). The project served a beneficiary population of approximately 20,000 by implementing child survival activities from October 1990 to September 30, 1993, in 23 communities in Northern Guatemala.

The survey questionnaire was initially designed at Cuernavaca, Mexico by Dr. García, IEF/HQ Child Survival Coordinator Jeffrey Brown and IEF/Guatemala Field Coordinator Guillermo Segura during the first week of September 1993. The IEF Project staff participated in a five day training program in WHO cluster sample survey methodology to learn how to conduct this type of survey as a routine activity to measure project progress. Seven teams of interviewers and five supervisors conducted the 30 cluster survey. Each cluster included 10 cohort household survey interviews of mothers with children less than 2 years of age. A total of 300 households were interviewed.

Major findings include:

- The rate of children with immunization cards recording complete immunization coverage was much lower than the estimated national and provincial figures for complete immunization.
- Less than half of mothers were treating diarrhea with ORT (SSS, ORS, or home fluids).
- More than 80% of children under four months of age were being exclusively breastfed.
- Over 50% of the children 12 - 18 months of age and 80% of

children 19 - 23 months of age had received at least one capsule of vitamin A since August 1992.

- More than 50% of mothers reported that they had a home garden containing foods rich in Vitamin A.
- Over 60% of mothers reported feeding their children foods rich in vitamin A, the great majority reporting at least three times weekly.
- Over 80% of mothers identified 2 or more sources of vitamin A rich foods.

## II. INTRODUCTION

### A. BACKGROUND

**Project Location/Background:** Guatemala, the northernmost country in the Central American isthmus, is a land of diversity. Its population of over 9.2 million inhabitants is almost equally divided among Ladino (52%--mixed Spanish-Indian origin) and indigenous Mayan groups (48% of population within 21 different groups.) Over 60% of its people live in 19,000 rural communities of less than 2,000 inhabitants. It is an extremely poor country with 77% of its families living below the poverty level.

**Health Problems:** Guatemala has one of the highest children's mortality rates in Latin America. A 1989 UNICEF study indicated an infant mortality rate (IMR) of 57 per 1000 and a child mortality rate of 102 per 1000. The same study showed the IMR in Alta Verapaz to be 62 per 1000, 10% higher than the country average. The two principal causes of infant deaths are respiratory infections and diarrheal diseases, accounting for 62% of the total. These two conditions also account for the majority of deaths among the general population.

Vitamin A deficiency is a significant public health problem. 1991 project baseline survey data revealed that over 21% of children under six in project villages are deficient, with circulating retinol concentrations of less than 20 ug/dl. Furthermore, seven-day recall data showed that 66% of these children consumed less than the WHO recommended daily amounts of vitamin A. While vitamin A fortification of sugar is mandatory by law, sugar is not consistently fortified. To further complicate this, many villagers do not eat commercially produced sugar, preferring instead to consume "panela" or "jugo de caña," locally produced sugar cane products.

Malnutrition is also a serious problem in Alta Verapaz. Among children under 5 years of age, over 33% weigh less than two standard deviations less than the WHO weight for age average, the most serious level of chronic malnutrition in Central America. Acute malnutrition (weight for height) is also a problem with 4.3% of children under 5 falling below two standard deviations. This statistic has steadily worsened since early 1988. To complicate matters, the Government does not have sufficient resources to attend to even 10% of these serious cases.

Vaccination coverage in the project area is very low, with only 31% of children between the ages of 12-24 months sampled in the previous project's 1991 baseline survey found to be completely immunized. Specific coverage results for antigens included 39% BCG, 52% DPT, 53% Polio and 53% measles. Tetanus toxoid coverage of fertile women between the ages of 15-44 years of age is only 12%.

Recent MOH ORT statistics estimate that only 39% of children in Alta Verapaz receive ORS during episodes of diarrhea. Similarly, the MOH cites that only 24% of children with ARI receive appropriate

attention. Furthermore, it is estimated that less than 60% of the children under one year of age in Alta Verapaz are reached by the MOH's Maternal and Child Health Program, the second lowest percentage among Guatemalan Health Regions.

Intestinal parasites seriously impact both the nutritional and health status of children in Alta Verapaz, resulting in decreased growth rates and decreased capacity to absorb vitamin A. A 1991 study in the project region showed prevalence rates of *Ascaris* of 82% of 4-6 year olds and 50% of 1-3 year olds.

Within Guatemala, the municipalities of San Pedro Carchá (population: 92,483) and San Juan Chamelco (population: 32,829) are located in the south-central region of the province of Alta Verapaz. Alta Verapaz is a mountainous, forested area in the Sierra Madre mountain range in central Guatemala with over 95% of its total population being indigenous, the highest percentage of indigenous people of all of Guatemala's provinces. The two principal groups are the Kekchi and Pocomchi. Its economy includes lumbering and cultivation of coffee and cardamon as well as subsistence farming.

**Summary Description of Project:** The IEF Vitamin A for Child Survival Project works in 23 communities in the municipalities of San Pedro Carchá and San Juan Chamelco. A staff of one Project Manager, two Area Supervisors and seven Promoters organize and manage project activities.

The above region was initially selected for the first vitamin A intervention project in 1990 because of the high rates of endemic hypovitaminosis A and child mortality and the history of previous IEF projects in the area.

The goal of this project is to decrease infant and child morbidity and mortality through vitamin A supplementation, improved nutrition and infection control. Principal interventions and their associated beneficiary population are follows:

- 1) vitamin A supplementation of children under 6 years of age twice a year,
- 2) diarrheal disease management of children under 6 years of age,
- 3) the promotion of family and school gardens among adults and children to increase the availability and consumption of vitamin A rich foods,
- 4) nutrition education focusing on vitamin A rich foods provided monthly to mothers groups during cooking demonstrations.
- 5) support of Ministry of Health (MOH) immunization activities,
- 6) training of MOH personnel, including village promoters, health technicians, nurses and physicians in the treatment vitamin A deficiency and diarrheal disease control (DDC).
- 7) treatment of intestinal parasites of children 2-6 years of age bi-annually.
- 8) provision of primary eye care to project children annually.

The current project has had significant accomplishments. This year

over 95% of registered children under six years of age (3000+) received vitamin A bi-annually. Another 2000+ between the ages of 2-6 years received anthelmintics for treatment of intestinal parasites. Over 180 cooking demonstrations and health education presentations were held in project communities. Over 6700 mothers attended these events. The availability of vitamin A-rich vegetables was greatly increased with the planting and harvesting of over 900 family and 21 school gardens. ORT distribution systems were established in all 23 villages and over 1000 latrines were delivered to, or constructed by families. Over 150 volunteers, 10 project staff, 70 MOH health promoters, 48 primary school teachers and 30 doctors, nurses and health technicians were trained in vitamin A, nutrition and gardening. MOH EPI activities were promoted and supported by project staff and finally, 31 village ophthalmological campaigns were held, screening and treating over 1200 community members.

**Objectives:** Original project objectives contained in the DIP included the following:

- 1) distribute Nutriatol to 4577 households & ensure 60% of mothers administer to children after disease episodes,
- 2) establish 40 school gardens,
- 3) provide nutrition education to 100% of 4577 mothers,
- 4) ensure that 75% of mothers can identify 2 or more sources of vitamin A rich foods,
- 5) provide vitamin A to 90%(4677) of children 6-71 months in project villages annually.

In the DIP, vitamin A activities were to account for 70% of the program's efforts with nutrition education amounting to the remaining 30%. Since the DIP, many changes have occurred. For example, the Nutriatol distribution activity was never implemented due to its high cost and low potential for sustainability. Other interventions directed at infectious disease control such as control of diarrheal diseases were added during the final year of the project to address many of the more serious child health problems in the region. Specific objectives were not established for these added interventions as they were initiated on a trial basis to assess their feasibility for inclusion in the proposed project extension.

Furthermore, the DIP estimated that the project would work with 4577 mothers in 40 villages. This was impossible due to following reasons:

- 1) Guatemala military denied permission for the project to enter certain villages due to reported guerilla activity,
- 2) Guatemala guerrillas recommended that the project not work in certain villages due to recent conflicts between their forces and the military,
- 3) some village leaders decided that the proposed benefits of working with the project were not significant enough, and hence decided to not support the project's initiation of activities.

Currently, the project is active in 23 communities targeting slightly over 2900 families. The current mix of services is approximately as follows:

- 50% vitamin A activities
- 30% nutrition activities
- 15% ORT
- 5% EPI

In 1991, USAID required PVOs with new FHA/PVC Child Survival grants to conduct a 30-cluster baseline survey using a standardized questionnaire developed by JHU. As part of this required process, the Johns Hopkins University Survey Trainer, Dr. Cecilia Garcia, was contracted to assist the IEF with three major tasks:

- (1) to explain the organization of the standardized questionnaire, as well as the purpose of each question,
- (2) to train IEF/GUATEMALA staff to conduct a standard WHO 30-cluster survey,
- (3) to coordinate the survey at field level and,
- (4) to train IEF/GUATEMALA staff to manually tabulate and analyze survey data.

#### **B. OBJECTIVES OF THE SURVEY**

The method of choice for these kinds of surveys is a 30 cluster sampling technique. The study population consists of mothers of children under the age of 24 months living in the PVO project area. By restricting the sample to mothers of children less than 24 months of age, repeat surveys can ascertain the project's ability to reach children born during the life of the project, and establish whether the project was successful in communicating to the mothers, through village based volunteers, certain action messages about key CS interventions.

A population based sample survey is one method of obtaining rates; i.e. data relative to denominators, which are an important part of project's health information system. The data collected from a sample survey can be used for project design, management information and evaluation purposes.

The objectives of the survey are to provide the IEF with information about the following issues:

- \* Knowledge of mothers of children under two years of age about: major threats to infant, maternal and child health; ways to prevent immunizable diseases; proper treatment of diarrheal diseases (ORT); signs, symptoms and treatment of acute respiratory infections; appropriate nutrition/weaning practices; information about vitamin A intake and its effect on the prevention of infectious diseases, and use of family gardens to increase the availability and consumption of vitamin A rich foods,
- \* Actual practices of mothers with regard to the

- interventions mentioned above,
- \* Target groups for health education action messages for future projects,
  - \* For children aged 12-23 months: the coverage rates of BCG, DPT3, OPV3, measles vaccines and drop out rates between series antigens,
  - \* For children aged 12-23 months: the coverage rates of vitamin A capsule distribution in the last year.

The survey establishes estimates of child survival knowledge and assesses the extent of practices of the project's primary health care interventions. The data collected will assist the IEF with the following:

- 1) evaluation of project activities and achievement of objectives described in the Vitamin A Project DIP; and
- 2) planning, management and assessment of future project activities targeted towards changing behaviors at the household level.

#### **C. SCHEDULE OF ACTIVITIES IN MEXICO AND ALTA VERAPAZ ,GUATEMALA**

August 2-6	Preparations for the survey and training (Mexico)
August 15	Travel to Guatemala
August 16-19	Training of supervisors and interviewers (Guatemala)
August 20	Field training exercise and discussion
August 21-25	Interviews
August 26-27	Manual tabulation of questionnaires
August 27-28	Group discussion of results and implications
August 29-30	Draft of report
August 30	Travel to Mexico

### **III. METHODOLOGY**

#### **A. THE QUESTIONNAIRE**

The questionnaire, which contains 43 questions, was designed to collect information from mothers of children under 24 months of age. The questions were based on a standardized survey format which USAID requires of all PVO CS projects. The standardized survey instrument was developed by the staff at PVO CSSP, with the assistance of US and international experts for the various intervention areas, and in cooperation with IEF/GUATEMALA field staff. IEF/GUATEMALA, in cooperation with the PVO CSSP Survey Trainer Cecilia Garcia, further customized the standardized survey questionnaire making the finalized

questionnaire appropriate to the actual project interventions and the project area.

- The first two questions ask about the age of the respondent (mothers) and her youngest child under 24 months of age;
- questions 3-6 collect data regarding mother's literacy, employment, and who cares for the child when the mother is away from home;
- question 7 gives information about the most important household health problem;
- questions 8-12 deal with breast-feeding and other feeding practices including vitamin A intake;
- questions 13-27 refer to mother's response to diarrheal disease and acute respiratory infections and management of the child with diarrhea and acute respiratory infections;
- questions 28-33 concern the immunization status of the child;
- questions 34-38 ask about vitamin A capsule intake in the last year and the planting of home gardens with vegetables rich in vitamin A;
- questions 39-43 concern pre-natal and delivery care.

The questionnaire was originally translated into Spanish from English by JHU. IEF/Guatemala staff translated the questionnaire into Kekchi. Further revisions were completed in Guatemala by Project staff with the assistance of Dr. García.

#### **B. DETERMINATION OF SAMPLE SIZE**

Sample sizes were calculated with the following formula:

$$n = z^2(pq) / d^2$$

Where **n** = sample size; **z** = statistical certainty chosen; **p** = estimated prevalence/coverage rate/level to be investigated; **q** = 1 - **p**; and **d** = precision desired.

The value of **p** was defined by the coverage rate that requires the largest sample size (**p** = .5). The value **d** was depends on the precision, or margin of error, desired (in this case **d** = .1). The statistical certainty was chosen to be 95% (**z** = 1.96). Given the above values, the following sample size (**n**) needed was determined to be:

$$n = (1.96 \times 1.96) (.5 \times .5) / (.1 \times .1)$$

$$n = (3.84) (.25) / .01$$

$$n = 96$$

It takes a tremendous amount of time to randomly select an identified individual from the survey population, and then perform this selection 96 times to identify a sample of  $n = 96$ . Time can be saved by doing a 30 cluster sample survey in which several individuals within each cluster selected to reach the required sample size. However, in order to compensate for the bias which enters the survey from interviewing persons in clusters, rather than as randomly selected individuals, experience has shown that a minimum sample of 210 (7 per cluster) should be used given the values of  $p$ ,  $d$ , and  $z$  above (Henderson, et. al., 1982). In general, when using a 30 cluster sample survey, the sample size used should be approximately double the value  $n$ , when:  $n = (z \times z)(pq)/(d \times d)$ . In this case, a sample size of 300 (10 per cluster) was selected so as to ensure that sub-samples would be large enough to obtain useful management type information.

The estimates of confidence limits for the survey results were calculated using the following formula:

$$95\% \text{ confidence limit} = p \pm z(\text{square root of } \{pq/n\})$$

where:  $p$  = proportion in population found from survey;  $z$  = statistical certainty chosen (if 95% certainty chosen, then  $z = 1.96$ );  $q = 1 - p$ ; and  $n$  = sample size

EXAMPLE: If the proportion of children in the survey who were completely and correctly immunized is 37% and  $n = 297$ :

$$95\% \text{ confidence limit} = .37 \pm 1.96(\text{square root of } \{.37 \times .63/297\})$$

$(z = 1.96)$

$$1.96 = .37 \pm .03 \quad (\text{or, } 34\% \text{ to } 40\%)$$

In other words, we are 95% sure that the actual proportion of children in the survey area who are completely and correctly immunized is between 34% and 40%.

### **C. SELECTION OF THE SAMPLE**

The sample consisted of 300 women with children 0-23 months of age in 23 communities in Alta Verapaz, Guatemala. Ten women were selected in each of 30 selected clusters following the process described in The EPI Coverage Survey training manual (WHO, Geneva, Oct. 1988).

Once the survey teams reached the designated cluster site, the survey direction and the initial household surveyed within the cluster were randomly selected.

### **D. TRAINING OF SUPERVISORS AND INTERVIEWERS**

The IEF/Guatemala staff had pre-selected supervisors and interviewers for training. The training of supervisors and interviewers required

five days. Prior to the first day of training, the PVO CSSP Survey Trainer and IEF/Guatemala staff reviewed the training curriculum and delegated responsibility for presenting the various training modules.

The **first training day** was dedicated to discussing with supervisors survey methodology and administration. In addition a final section of the questionnaire that had not yet been translated was translated into Kekchi. Finally, IEF/Guatemala staff and the PVO CSSP Survey Trainer conducted the following classes: (a) purpose and objectives of the survey, (b) selection of the sample size, (c) selection of the starting household and survey direction, (d) community protocols and taboos.

On the **second day**, IEF promoters who would be the actual interviewers participated in the testing of the first half of the questionnaire and were trained in interviewing techniques.

The **third day** of training involved the completion of the testing of the questionnaire, a discussion of the roles of the supervisor and interviewers and the design of a special events calendar to be able to determine more accurately the child's age in case the mother didn't know or remember the birthdate of her child. A list of antibiotics and anti-diarrheal medicines existing in the region was developed and finally, role playing was conducted to gain experience in the administration of the questionnaire.

The **fourth day** of training focused on the selection of houses and problem-solving in the field (what to do if one encounters a sick child, sick mother, drunk father, etc.) Role playing continued in small teams.

The **final day** of training commenced with a field test of the survey questionnaire in the community of Tzunutz. Each supervisor interviewed one mother while each surveyor interviewed two mothers of children 0-23 months old.

After this field test was completed, a discussion of the day's results took place in order to establish final logistic arrangements and changes to the questionnaire.

#### **E. SURVEY IMPLEMENTATION**

The survey was conducted over four days; August 21 and 23 -25. Thirty survey areas were randomly selected by the survey coordinators. The supervisors of each team were responsible for the selection of the survey direction and starting household. The supervisors observed at least one complete interview by each surveyor each day. Each questionnaire was checked for completeness before the survey team left the survey area, so that, in the case of missing or contradictory information, the mother could be visited again the same day.

## F. METHOD OF DATA ANALYSIS

### General

Data Processing was carried out through manual tabulation August 26 and 27. The IEF/Guatemala Project Manager and the PVO CSSP Survey Trainer supervised the hand tabulation.

Seven two-person teams, made up of supervisors and interviewers, tabulated the data. This manual tabulation required two complete days. The questionnaires were organized by cluster site, and each cluster of questionnaires was circulated between each of the tabulators. The tabulators each recorded the responses to one question at a time reviewing each of the 300 survey questionnaires until all the responses to each particular question had been tabulated. The PVO Trainer and the Project Manager analyzed the results of the questions tabulated and then wrote out the analysis on the hand tabulation sheets.

### Univariate and Bivariate Analysis

For the first draft of the survey report, the IEF/Guatemala staff calculated frequency distributions for each of the questions and key cross tabulations by child's age.

To reduce the importance of age misreporting, tabulations were limited to broad age groups. In most cases, the tabulations are for all children under age 2 (that is, 0-23 months), separately for children 0-11 months and 12-23 months. In cases where a child is "about one year old" or "about 2 years old" the interviewers were trained to probe to try to determine whether the child was past its first (or second) birthday.

Immunization coverage was analyzed by looking at children aged 12-23 months. By restricting the sample to children of these ages, estimates of the percentage of children fully immunized within the first year of life were made. For example, if only 50% of the children aged 12-23 months in the survey were fully immunized, it could be assumed that the percentage of children in the project area who received the full set of immunizations by age 12 months was 50% or less.

Once the frequency tables and cross tabulations were finalized, the results of the survey were compared to Guatemalan MOH and UNICEF/WHO health messages and Vitamin A project objectives, in order to develop the first draft of the survey report. This was done during a group discussion on August 27 and 28 with all those involved in the training, interviews, and tabulation. The consensus of the group was recorded and provided the basis for the results and discussion sections of the survey report.

#### IV. RESULTS

The following answers were given for the 43 questions. 300 questionnaires were manually tabulated for analysis. No questionnaires were excluded from the analysis.

##### IDENTIFICATION MODULE

1. Mothers ages ranged from 15 to 44 years. The mean age reported by mothers surveyed is 28.8 years. 33% of mothers surveyed (100 out of 300) are under 18 years. 20% or 59 mothers who were surveyed are over 35 years.

MOTHER AGE	Freq	Percent
< 18	100	33.33
18-35	141	47.01
> 35	59	19.66
TOTAL	300	100%

2. 22% (66) of children in the survey were under four months of age. 59% (176 out of 300) of children in the survey were under the age of one year. 41% (124 out of 300) of the children in the survey were between the ages 12-23 months. The mean age of children was the survey is 9.86 months with a range of 1 to 23 months.

##### MOTHER'S EDUCATION AND OCCUPATION MODULE

3. Only 13% (38 out of 300) of mothers surveyed reported that they could read in some language.
4. Within the group of mothers surveyed that stated that they could read, 13% (5 out of 38) could read only in Spanish, and 55% could read only in Kekchi. Only 32% (12 out of 38) reported that they could read both languages.
5. 33% (100 mothers) stated that they do not engage in any income generating activity. 29% (88 mothers) stated that they earn income from selling handicrafts. 10% (31 mothers) stated that they earn income from harvesting coffee or cardamom. 20% (60 mothers) reported that they earn income from selling agricultural products while 14% of mothers reported selling prepared foods. 1% (3 mothers) reported that they earned income as servants. 4% (11 mothers) stated that they earned income as street/store vendors, and finally three mothers (1%) reported earning income from categories not listed in the questionnaire.
6. 40% of mothers (122 out of 300) took their child with them when they left home. 2% (5 mothers) left their children with their husband or partner and 40% of mothers reported that their older children took care of the child when the mother was away from home. 55 mothers (18%) left their children with relatives. One

mother (0.33%) left her child with a neighbor or friend and one mother left her child with a maid servant.

#### HOUSEHOLD HEALTH PROBLEMS

7. 5% of mothers (14 mothers) reported that respiratory problems were the most frequent health problem in their household. 61% (183 mothers) stated that the most frequent problem was fever. Vomiting/diarrhea was the most frequent problem for 21% (62 mothers) while reproductive health problems were stated as the most frequent problem for 0.33% (one mother). 1% (four mothers) reported that rheumatism was their most frequent health problem while only 6% (19 mothers) stated "other" to be the most frequent health problem in their household. Among "other" 4% reported that headaches were most frequent and 2% stated that skin problems were the most frequent problems. 6% (17 mothers) stated they had no health problems at all.

#### BREASTFEEDING/NUTRITION MODULE

8. 94% of mothers (283 mothers) reported that they were breastfeeding their child. Of those mothers in the survey with children 20-23 months of age (28 mothers), 71% (twenty mothers) were still breastfeeding their children. Of the eight mothers who were not breastfeeding their children, only two (0.66%) reported that they had not breastfed the child in the past.
9. 29% of mothers (87 of 300) reported that they had breastfed their child within one hour after delivery. 22% (67 of 300) reported breastfeeding between one and eight hours after delivery. 138 mothers (46%) reported breastfeeding more than eight hours after delivery, and six mothers (2%) stated that they did not remember when they first breastfed their child after delivery.
10. Of the 59 children 0, 1, 2 and 3 months of age, 91% were being exclusively breastfed -- defined as not being given any of the food/fluid categories listed in question 10 (10a-10i).

Of the children 5, 6, 7 and 8 months of age (39 children), 68% had been introduced solid or semisolid foods -- defined as being given at least one of the non-fluid categories listed in question 10 (10c - 10i).

Of the children in the survey 5 months of age and older (223 children), 62% (187 children) were being given a food rich in vitamin A, (green leaves, yellow fruits and vegetables egg yolk or cheese). Of the 187 children that did receive foods rich in vitamin A, 11% received it daily, 57% received it every other day, and 14% received it once a week or less.

58% of children were being fed foods rich in protein (chicken, beef, fish, etc.), and 91% were given high energy foods (cereal,

sugar, honey etc.).

11. When asked when a mother should start giving a child foods in addition to breastmilk, 36% (107 out of 300) mothers responded when the child was between four and six months old. 3% (eight mothers) indicated an age earlier than four months and 44% (131 mothers) indicated an age six months or later. 54 mothers (18%) stated that they did not know when.
12. When asked about foods rich in vitamin A 80% (241 mothers) were able to identify two or more of these foods.

#### DIARRHEAL DISEASE MODULE

13. 30% (90 of 300) of the mothers surveyed stated that their child had diarrhea within the two weeks prior to the survey.
14. Of the 90 children with diarrhea during the two weeks prior to the survey, 86 were still being breastfed. Of these 86 children, 13% (11 children) were given more breastmilk than usual and 26% were given the same amount of breastmilk as usual. 51 mothers (59% of 86) gave their child less breastmilk than usual during diarrhea, and two mothers (2% of 86) stopped giving their child breastmilk completely during the diarrhea episode. In summary, 62% (53 of 86) gave less breastmilk or stopped giving breastmilk completely.
15. Of the 90 children with diarrhea during the two weeks prior to the survey, 68 were being given fluids other than breastmilk. Of these 68 children, 10% (7 children) were given more fluids than usual and 26% were given the same amount of fluids as usual. 38 mothers (56% of 68) gave their child less fluids than usual during diarrhea, and five mothers (7% of 68) stopped giving their child fluids completely during the diarrhea episode. In summary, 63% (43 of 68) gave less fluids or stopped giving fluids other than breastmilk completely during their child's diarrhea episode.
16. Of the 90 children with diarrhea during the two weeks prior to the survey, 59 were being given solid or semisolid food. Of these 59 children, 2% (1 child) were given more foods than usual, and 10% were given the same amount of food as usual. 37 mothers (63% of 59) gave their child less food than usual during diarrhea, and 15 mothers (25% of 59) stopped giving their child food completely during the diarrhea episode. In summary, 88% (52 of 59) gave less food or stopped giving food completely during their child's diarrhea episode.
17. Of the 90 children with diarrhea during the two weeks prior to the survey: 25 mothers (28%) did not give any treatment for their child's diarrhea, 13 children (20% of 90) were given at least one of the ORT categories listed in question 20 (20b-20e). 13 (14%) gave an ORS sachet, 4 (4%) mothers gave their child a

sugar salt solution. One mother (1%) gave home fluids (water, coffee and tea) to her child. 40 mothers (50% of 90) gave their child antibiotics and/or medicines used for diarrhea and ten mothers (11%) gave something other than the categories listed in question 20. In summary, only 20% of mothers treated their child's diarrhea with ORT while 50% of mothers utilized antibiotics or other medicines.

18. Of the 90 mothers of children with diarrhea during the two weeks prior to the survey, 27% (24 mothers) sought advice or treatment for their child's diarrhea.
19. Of the 24 mothers who sought advice or treatment for their child's diarrhea: 16% (4 mothers) went to a health center, 4% (one mother) went to a private clinic or doctor, and 12% went to the drugstore to ask for advice. 46% (11 mothers) went to a village health worker and one mother (4%) went to a traditional healer. Three mothers (12%) sought advice from relatives for their child's diarrhea and finally one mother (4%) reported having sought advice or treatment from someone other than those listed in the categories in question 19. In summary, the majority of mothers (67%) seeking treatment assistance for their child with diarrhea sought the services of a trained health worker.
20. 72% (215 of 300 mothers) stated a sign/symptom that would cause them to seek advice or treatment for their child's diarrhea. 23 of 300 (8%) mothers stated that vomiting was a sign/symptom that cause them to seek advice or treatment for their child's diarrhea. 24 of 300 mothers (8%) stated "fever" as a sign/symptom. 116 mothers (39%) stated that dry mouths, deep-set eyes and fontanel and very infrequent urination were symptoms that would cause them to seek advice or treatment. 40 mothers (13%) stated prolonged diarrhea as a sign/symptom. 0.66% (two mothers) reported that blood in the stool was a sign/symptom, and 12% stated that rejecting food and liquids would cause them to seek advice or treatment for their child's diarrhea. 12% (35 mothers) responded to this question that faintness was a sign/symptom and 3% (nine mothers) responded that 10 or more bowel movements per day would require advise or treatment. Fourteen mothers responded with a sign/symptom other than the ones listed in question 20. The majority of these other responses (88%) were actually definitions of diarrhea, in other words "loose stools."
21. 72% of mothers (216 of 300) were able to state important actions to take if a child had diarrhea. 53 mothers (18%) stated that initiating fluids rapidly is an important action to take if a child has diarrhea. 17 mothers (6%) stated that giving more to drink than usual is an important action, 16 mothers (5%) stated that giving the child smaller more frequent feeds is an important action, 27% of mothers answered that proper administration of a sugar-salt solution (SSS) is an important

action to take if a child has diarrhea, 10% (30 of 300) stated that taking the child to the health center is an important action to take if the child has diarrhea, and 13 mothers (4%) stated that feeding more than usual during the diarrhea episode is an important action.

No mother stated that withholding fluids is an important action, and only one mother stated that withholding foods is an important action to take if the child has diarrhea.

122 mothers (41%) stated that giving drugs is an important action.

In summary, only 27% of mothers identified ORT as an appropriate treatment for children's diarrhea in contrast to 41% listing antibiotics/medicines as an appropriate response.

22. 71% of mothers (212 of 300) stated one or more important actions to take when the child was recovering from the diarrhea. 35% (106 out of 300 mothers) stated that giving the child smaller, more frequent feedings is an important action to take when the child is recovering from diarrhea. 23% (70 out of 300) of mothers responded to this question by indicating that giving more foods than usual is an important action.

81 mothers (27% of 300) responded with giving the child foods with high caloric content as important actions to take when the child is recovering from diarrhea.

#### RESPIRATORY PROBLEMS MODULE

23. 32% (95 of 300) of the mothers surveyed stated that their child had had respiratory problems within the two weeks prior to the survey.
24. Of the children with respiratory problems 84 (88%) breathed very fast and with difficulty.
25. 58% (49 out of 84) of the mothers whose child breathed rapidly and with difficulty sought treatment for their child's respiratory problem.
26. Of the mothers (49) who sought treatment for their child's acute and serious respiratory problem (fast and difficult breathing) two weeks prior to the survey, 10% (five mothers) went to a health center, 8% (four mothers) went to a private clinic or doctor, 12% went to the drugstore to ask for treatment, 51% (25 mothers) went to a village health worker, 10% sought treatment from a traditional healer, one mother (2%) sought advice from relatives for their child's respiratory problem and seven mothers (14%) reported having sought treatment from "other" different than the categories listed in question 25. Among "other" 100% mothers stated that they used drugs for treatment.

27. 69% (208 of 300 mothers) stated a sign/symptom that would cause them to seek advice or treatment for their child's respiratory problem. 104 of 300 (35%) mothers stated that fast, difficult breathing was a sign/symptom that cause them to seek treatment for their child's respiratory problem. 24 of 300 mothers (8%) stated deep-chest breathing as a sign/symptom. 43 mothers (14%) stated that loss of appetite was a sign/symptom of need for treatment. 45 mothers (15%) reported that fever was a sign/symptom, and 29 mothers (10%) answered that coughing was a sign/symptom that would cause them to seek treatment for their child's respiratory problem. 12 mothers (4%) responded with a sign/symptom other than the ones listed in question 27.

#### IMMUNIZATION MODULE

28. 197 mothers (66% of 300) stated that their child had received at least one immunization and 95 of the 114 mothers with children aged 12-23 months (83%) reported that their child had received at least one vaccination.
29. 8 mothers (3% of 300) stated that a child should receive its measles vaccine at age nine months. Twenty mothers (7%) stated that a child should receive the measles vaccine at six months of age. 272 mothers (91%) gave an age other than nine months or six months, or stated that they did not know when a child should receive the measles vaccine.
30. 112 mothers (37% of 300) stated that the main reason why pregnant women need to be vaccinated with the tetanus toxoid vaccine was to protect both the mother and child. 11% (32 mothers) stated that the main reason for the TT vaccine was to protect the woman against tetanus, and 19% (57 of 300) stated that the main reason was to protect the newborn infant. 99 mothers (33%) stated that they did not know, or stated something other than the categories listed in question 28.
31. Five mothers (2%) stated that a pregnant woman needs one TT injection. 24 mothers (8%) stated that a pregnant woman needs two TT injections and 131 mothers (44%) stated that a pregnant woman needs more than two tetanus toxoid injections to protect the newborn infant from tetanus. In summary, 52% of mothers stated that a pregnant woman needs at least two TT injections to protect the newborn infant from tetanus. One mother (0.33%) stated that TT injection wasn't needed to protect the newborn, and 139 (46%) mothers reported that they did not know how many TT injections a pregnant woman needs. In summary, 52% of **mothers** stated that a pregnant woman needs at least two TT injections to protect the newborn infant from tetanus.
32. 138 mothers (46%) had an immunization card for their child. 37 mothers (12%) stated that they had lost their child's immunization card, while 125 mothers (42%) stated that they never had a card for their child.

33. The immunization status for children 12-23 months of age is based on the immunization card actually seen by the interviewers. There were 114 children in the survey 12-23 months of age. The following results are coverage figures for OPV, DPT, measles and BCG:

**OPV STATUS**  
**OPV 1, 2 & 3: CHILDREN 12-23 MONTHS OF AGE**

	FREQUENCY (#)	PERCENT (%)
OPV 1	54	47.7
OPV 1,2	34	29.2
OPV 1,2,3	20	17.5
D.O (#OPV1-#OPV3)	34	
D.O RATE		62.0

**DPT STATUS**  
**DPT 1,2 & 3: CHILDREN 12-23 MONTHS OF AGE**

	FREQUENCY (#)	PERCENT (%)
DPT1	48	42.1
DPT1 & 2	25	21.9
DPT1,2 & 3	16	14.0
D.O (#DPT1-#DPT3)	32	
D.O RATE		66.0

**MEASLES STATUS**

AGE GROUP	NO MEASLES	YES MEASLES	TOTAL
12-23 Months	74 (64.9%)	40 (35.1%)	114 children

### BCG STATUS

AGE GROUP	NO BCG	YES BCG	TOTAL
12-23 Months	106 (93.0%)	8 (7.0%)	114 children

### FULLY IMMUNIZED STATUS (BCG + OPV123 + DPT123 + MEASLES)

AGE GROUP	NOT FULLY IMMUNIZED	FULLY IMMUNIZED	TOTAL
12-23 Months	111 (97.4%)	3 (2.6%)	114 children

### VITAMIN A CAPSULE INTAKE MODULE

#### Stated by the Mother

34. Fifty-one percent of mothers with children between the ages of 12-18 months reported that their children had received vitamin A. Eighty-one percent of mothers with children between the ages of 19-24 months stated that their children had received vitamin A.
35. In the last year, 50% of mothers of the children 12 to 18 months old stated that their children had taken at least one dose of oral vitamin A. Regarding children ages 19 to 23 months, 81% were reported to have taken had taken at least one dose of vitamin A, with 32% received two doses.

#### Stated in the Card

36. Of the children that had received at least one dose of vitamin A (89 children), only 7 children had this noted in their vaccination record or in a special vitamin A card (8%). Of those children 12-23 months old only 3% had one dose of vitamin A noted in their vaccination record/vitamin A card. Only 3% of children between the ages of 19 and 23 months of age had two doses noted in their vaccination records/vitamin A card.

### HORTICULTURE MODULE

37. 190 mothers (63%) reported that they had a home garden.
38. 163 mothers (54%) reported that they had a home garden with plants rich in vitamin A.

### MATERNAL CARE MODULE

39. 46 mothers (15%) surveyed had maternal health cards. 27 (9%) reported having lost their maternal health card, while 227 (76%) stated that they did not have a maternal health card.

40. Of the mothers who had a maternal health card, 20 (45%) had at least two TT injections indicated on the card. 16 mothers (36% of 46) had one TT injection indicated on the card. Eight mothers (18%) had no TT injections indicated on the card.
41. Of the 46 maternal cards with spaces to record ante-natal visits, 23 (52%) indicated that the mother had made at least two ante-natal visits. Seven (16%) indicated that the mother had made one visit and the 14 remaining indicated that the mothers had not made any ante-natal visit.
42. When asked how soon after a woman knows she is pregnant should she see a health professional, 117 mothers (39% of 300) indicated a time period within the first trimester of pregnancy, 106 mothers (35%) indicated a time period within the second trimester, and 17 mothers (6%) indicated a time period within the third trimester. 4 mothers (1%) indicated that there was no need to see a health professional during pregnancy, and one mother reported that only when she felt sick or had health problems related to pregnancy.
- 55 (18%) mothers stated that they did not know when a pregnant woman should see a health professional.
43. When asked who tied and cut the cord at the child's delivery, 22 mothers (7% of 300) indicated a health professional (physician or nurse). 103 mothers (34%) indicated a traditional birth attendant, (44%) mothers indicated a family member, and 26 mothers (9%) stated that she herself had tied and cut the cord. 18 mothers (6%) indicated someone other than the categories listed in this question.

## V. DISCUSSION AND RECOMMENDATIONS

### AGE DISTRIBUTION

Of the mothers surveyed 20% were over the age of 35 years and 33% were under 18 years. Around 60% of the children in the survey were under 12 months of age. In the few instances where a mother had two children under 24 months old, the interviewers were instructed to use a method to randomly select one of the children and then ask questions regarding only that child.

### EDUCATION/OCCUPATION

Only 13% of the mothers questioned in this survey indicated that they could read. The Project should continue to utilize adult learning methodologies such as demonstrations, role plays, pictorial presentations, group discussions and radio messages and support any existing adult literacy programs.

Many mothers take their infants with them when they leave home for work. Other caretakers mentioned particularly by mothers were older siblings. In order for the promoters and volunteers to reach the target population of caretakers, home visits should take place with due consideration for the mother's large workload and busy schedule. Market days and church are just some of the scheduling considerations outside of the normal long workday for mothers in this region. In order for health messages to reach older siblings, the project should continue its collaboration with primary school teachers.

It is important to mention that less than 2% of husbands take care of their children when the mother leaves home.

67% of mothers reported that they engage in some form of income generating work. As a result one could likely suppose that the majority of families have some capability of paying for health expenses. Focus groups and other qualitative methods could be used to identify the availability of monetary resources for health expenses.

#### BREASTFEEDING/NUTRITION

Of the 59 children in the 0, 1, 2, and 3 month age group 91% of the mothers stated in the survey that their infants were being exclusively breastfed. About 65% of mothers, when asked, stated that they did not know that children should be introduced to foods other than breastmilk between four and six months of age, yet only 3% stated food should be introduced before 4 months of age. However 68% of the 39 children in the 5-8 month age group had already been introduced to solid or semi-solid foods. Therefore, the lack of exclusive breast feeding or untimely introduction of solid or semi-solid foods are not significant problems in project villages.

Nevertheless, the Coban project should continue to emphasize the benefits of exclusive breastfeeding during the first four to six months by targeting mothers, VHWs, TBAs, and professional health workers.

In the survey 77% of mothers stated that they breastfed their child within the first eight hours after birth. The Project should continue to emphasize the benefits of early initiation of breastfeeding after delivery during the training of TBAs, VHWs, and other health workers.

In the survey 99% of the children had been breastfed at some time and at the time of the survey 94% were still being breastfed. Of the children in the 20-23 month age group, 71% were still being breastfed. Mothers should be encouraged to continue breastfeeding their children up to the age of two. The Project should reinforce the benefits of prolonged breastfeeding during any training of VHWs, TBAs, and the communities themselves. All health workers in the

project area should receive instruction on the benefits of breastfeeding for the first two years of a child's life.

Most mothers are giving their children foods high in calories and rich in protein and vitamin A. 62% of children 5 months and older were reportedly fed vitamin A rich foods. 68% of these children received these foods at least three times per week. 80% of mothers could identify 2 or more foods rich in vitamin A.

#### DIARRHEAL DISEASES

62% (53 of 86) gave less breastmilk or stopped giving breastmilk completely. 63% (43 of 68) gave less fluids or stopped giving fluids other than breastmilk completely during their child's diarrhea episode. 88% (52 of 59) gave less food or stopped giving food completely during their child's diarrhea episode. While most of this reduction of breast milk, fluids and food intake is related to the child's lack of thirst/hunger, program efforts need to continue to promote the proper feeding practices during and after episodes of diarrhea.

Only 20% of the mothers in the survey were giving ORT to their children during diarrhea. Approximately 50% of the mothers were giving their children medicine for the diarrhea. This data indicates that the Project should continue to place special emphasis on the use of ORT to treat diarrhea and to emphasize the dangers of using medicines for diarrhea. This could include organizing training sessions or workshops for local pharmacy personal as well as health workers.

Many mothers (28%) could not name any sign that would cause them to seek help during their child's diarrhea episode. Only 39% of mothers were able to list any signs or symptoms of dehydration. It is important for the Project to continue to emphasize recognition of signs of dehydration in their health education messages.

#### ACUTE RESPIRATORY INFECTIONS MODULE

More than 30% of the mothers surveyed stated that their child had respiratory problems within the two weeks prior to the survey, and of the children with respiratory problems more than 80% had signs of pneumonia (breathed very fast and with difficulty.)

It is important to inform that special attention was provided to this question in the training process due to the fact that in the field experience almost all mothers reported that their children breathed fast and with difficulty. These reported rates of pneumonia greatly exceed existing MOH data regarding the incidence of pneumonia among children in Alta Verapaz. After a discussion with IEF staff it was concluded that the formulation of the question regarding signs of pneumonia is either not appropriate for this population or the

translation of this question was very imprecise. Breathing patterns change in many ARI's and fever by itself can increase the frequency of respiration. Perhaps the mother's perception of the way the child breathed led to the incorrect categorizing of respiratory problems.

Of the mothers who reported that their child breathed rapidly and with difficulty less than 60% sought treatment for their child's respiratory problem. Of this group, only 20% sought treatment with a medical doctor. Of the 300 mothers surveyed, less than 35% identified the alarm sign/symptom of low respiratory infections as signs of need of treatment. **This data highlights the necessity of bringing to the communities more information about the identification of alarm signs during the ARI episode, and about the importance of seeking adequate treatment when these symptoms are present.**

More information is needed in order to determine which are the main obstacles for giving the correct care to children with ARI in this population. If lack of access to health services is the main problem faced by this population, the project should work in coordination with the MOH in training health promoters to identify and refer children with signs of ARI, specially with pneumonia.

#### IMMUNIZATIONS

Only 46% of 300 mothers interviewed had an immunization card for their child. An additional 12% stated that they had lost their child's card. However, almost half of the children never had a vaccination card. Of the 113 mothers with children aged 12-23 months ninety-five (84%) reported that their child had received at least one vaccination.

Antigen-specific immunization coverage rates determined by this survey for the 12-23 month age group with an immunization card (46% of children surveyed) were: BCG 7%, OPV123 34%, DPT123 25%, and Measles 43.4%. **Immunization rates of all children 12-23 months of age surveyed, included those without cards, dropped to the following: BCG 7%, OPV123 18%, DPT123 14%, and Measles 35%. The rate of children fully immunized against BCG + OPV123 + DPT123 + Measles was less than 3%.**

These rates are much lower than MOH-Coban estimate of 1992 (BCG 9%, OPV123 60% and measles 39%)

In the surveyed population, the drop out rate based on those children who received the first OPV vaccine versus those who continued up to the third OPV is about 60% The difference between the first and third DPT is also approximately 60%.

The high percentage of mothers with children between the ages of 12 - 24 months (83%) who reported that their child had received immunizations versus the 46% of mothers who had in their possession

immunization cards for their children indicates a discrepancy in vaccine coverage even if we take into account those that claimed to have lost their cards. This may suggest that vaccinations given during immunization campaigns are not reaching children the number of times required to fully immunize in the first year of life, that the MOH is not giving mothers a card every time a child starts his vaccination process or is not writing down each vaccination in the card. **More information is needed to understand why these discrepancies exist.**

**The Project should continue to support the MOH's immunization efforts and to encourage mothers to safeguard their cards. Also the Project should train HPs/VHWS/TBAs to counsel families and reinforce the message on the importance of completion of the EPI schedule during a child's first year of life.**

According to the survey the mother's overall knowledge about the timing and purpose of immunizations is fairly good. For example, 52% of mothers said that a pregnant woman needs at least two TT injections to protect the newborn infant. **The Project should continue to reinforce messages about the timing and benefits of immunizations for both the mother and child.**

#### **VITAMIN A INTAKE**

While the project's registers indicate vitamin A supplementation coverage rates of over 90% the survey indicates lower figures with 51% of children 12-18 months of age receiving vitamin A and 81% children between the ages of 19 and 24 months receiving vitamin A at least once annually, and 32% of these same children receiving two doses. Possible explanations for these discrepancies include:

- 1) incomplete coverage of village registers in some of the larger, more disperse communities,
- 2) mothers lack of accurate recall.
- 3) registers record children under 72 months of age, and not just children under 24 months.

**Nevertheless, the project needs to identify areas not served in targeted communities and ensure they are included in future activities.**

It was also noted that less than 8% of children between the ages of 12 and 24 months had record of receiving vitamin A. The project acknowledges that it has had difficulties in convincing mothers to bring their children's vaccination records to vitamin A campaigns for recording of vitamin A doses. It is recommended that these efforts be strengthened in future supplementation efforts. Furthermore, it is recommended that the project continue to coordinate vitamin A supplementation efforts with MOH vaccination campaigns.

### **HORTICULTURE**

One of the significant achievements of the project demonstrated in the survey, is that more than half of the women have home gardens with vegetables rich in vitamin A. **Families should be encouraged to continue to plant and harvest home gardens.**

### **MATERNAL CARE**

Less than 20% of mothers surveyed had maternal health cards. Of those mothers with cards, however, almost half had received two TT injections, and 80% had received at least one TT injection. Almost 70 % of the mothers with cards with spaces to record pre-natal visits had made ante-natal visits. Possession of maternal cards appears to be a good indicator of access to ante-natal care. **In order to better estimate the access to pre-natal care and TT coverage of pregnant women, all women of child-bearing age in the project should receive primary health care cards.**

A very low percentage of deliveries were attended by health professionals while 34% of deliveries were attended by TBA's. Another 44% of deliveries were attended by family members. **This data highlights the importance of training TBA's and incorporating them into the Alta Verapaz primary health care system and developing community messages regarding delivery care.**

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