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**Nicaragua Child Survival VIII Project
Rio San Juan
Knowledge and Practice Baseline Survey**

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**RIO SAN JUAN
BASELINE SURVEY (FY 93)**

**KNOWLEDGE AND PRACTICE SURVEY
WORLD RELIEF NICARAGUA**

OCTOBER - NOVEMBER, 1992

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EXECUTIVE SUMMARY

The baseline Knowledge and Practice Survey (K&P) was carried out in the Rio San Juan region of Nicaragua from October 15 - October 23, 1992 to assess baseline levels of the knowledge and practice of mothers of children 0-23 months. This information will be used to set objectives and determine target populations for the WRC/Nicaragua Child Survival Project.

The survey followed the WHO "30 cluster" model. The initial questionnaire developed by the PVO Child Survival Support Program (PVO CSSP) at Johns Hopkins University was adapted to the field through consultation with the Adventist Development and Relief Agency (ADRA) Nicaragua, Project Hope and WRC Honduras Child Survival (CS) projects. The survey was finalized through discussion with WRC Nicaragua field staff and a pilot test in Acoyapa, Nicaragua.

Major findings include:

- Breastfeeding: Only 58.9% of mothers were breastfeeding their children at the time of the survey. Bottlemilk is being given to 72.5% of the children and exclusive breastfeeding of children 0-3 months is 12.2%.
- Diarrheal Disease Management: Of those children who had diarrhea in the last two weeks, only 27.9% were treated with ORS and among those treated for diarrhea the use of antidiarrheal medications or antibiotics was high at 46.4%. In addition, use of home fluids was 8.8% and 15.9% knew to give fluids quickly, while only 1.6% knew to give fluids in abundance. Only 17.1% knew at least one sign of dehydration.
- Vaccination Coverage: The percent of children 12-23 months who were fully immunized was 37.5% of those who had cards and the drop-out rate was 21.4%.
- ALRI: Of the children surveyed, 40.3% had an acute respiratory infection in the last two weeks. Only 52.9% of the mothers of these children sought help at the hospital, health center/health post, or private doctor.

- Birth Spacing: 71.3% of the mothers interviewed stated that they were not pregnant and did not want another child in the next two years, yet the modern contraceptive prevalence among these women was only 37.0%.
- Vitamin A: Only 6.2% of the mothers knew that Vitamin A prevents night blindness and 70% of mothers did not know which foods contain Vitamin A.
- Malaria Control: Twenty-five percent of mothers were not using any method of malaria prevention. Knowledge of fever as a sign of malaria was fairly high at 72%.

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I. INTRODUCTION

A. Background Information

Rio San Juan has a population of 51,527¹ and is located in the southeastern region of Nicaragua bordering Costa Rica. The Rio San Juan region serves as a magnet for the settlement of large numbers of returning refugees, ex-resistance fighters and ex-soldiers and is marked by significant poverty. Heavy rains ten months of the year (annual rainfall is 100 - 120 in.)², poor roads and access to some areas only by water characterize difficult living and travel conditions in the area.

Rio San Juan is divided into five health service municipalities. All of these were included in the baseline survey except for San Juan del Norte which is not part of our project area. The health services for this area are under the SILAIS (Local Integrated Health Attention System) of Special Zone III. This SILAIS covers 6,984 km² and consists of 18 health posts, five medical posts and one hospital in San Carlos (the largest city).³

The infant mortality rate for Rio San Juan is 58/1000 (1989).⁴ Based on hospital statistics, 40% of infant deaths are due to acute diarrheal disease and 11% to ALRI/Pneumonia.⁵ A recent study also shows that an estimate of 31% of children under five are malnourished in this region.⁶

B. Objectives of the Baseline Survey

The purpose of this survey was to provide a baseline assessment of the knowledge and practice of mothers in the intervention area for immunization, nutrition, growth monitoring, diarrheal disease control, vitamin A, ALRI/pneumonia, maternal health, malaria control and income generation. In addition this information will be used to set objectives and determine populations to be targeted by the WRC Nicaragua Child Survival VIII Project.

C. Schedule of Activities

- Aug.-Sept. WRC staff laid the groundwork for the survey. This included: developing the 1st draft of the survey, listing all the communities and their respective populations for the area surveyed, hiring promoters for the project area who would also serve as supervisors and interviewers, communication and coordination with the survey trainer, setting up budgets for training expenses, purchasing supplies for the interviewers, obtaining the training site, and planning food and accommodations for all those involved.
- Oct. 11 Arrival of Dr. Orestes Zuniga to the World Relief Nicaragua (WRN) central office.
- Oct. 12-13 Final review of the survey with the survey trainer and establishment of the training schedule.
- Oct. 14 Travel to the training location.
- Oct. 15-17 Training of Supervisors (15th a.m.).
Training of Interviewers and Supervisors (15th and 16th).
Pilot test of the questionnaire (17th).
Final revisions and reproduction of the questionnaires.
- Oct. 18 Travel to interview sites and commencement of data collection.
- Oct. 19-22 Data collection.
- Oct. 21 Arrival of Lisa Filoramo to conduct hand tabulation training and training on computer analysis using Epi Info 5.1b.
- Oct. 22-23 Hand tabulations of the data collected.
- Oct. 24 Departure of Dr. Orestes Zuniga.
- Oct. 28-Nov.1 Data entry into computer.
- Nov. 2-3 Computer analysis of the findings.
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- Nov. 9 Feedback to WRN staff and Development Associates (USAID).
- Dec. 1 Survey results presented to other PVOs and church leadership.

Jan. 11-15 Survey results presented to regional MINSA officials and community leaders.

II. METHODOLOGY

A. The Questionnaire

The preliminary questionnaire was first developed at PVO CSSP/Johns Hopkins based on the objectives of the project. Discussions were held with WRC headquarters and Johns Hopkins' staff to develop the first draft of the questionnaire to be used at the field level. The questionnaire was translated to Spanish and revised with input from ADRA, Project Hope Nicaragua, WR Honduras and discussions with project staff. A pilot test was conducted on the last day of training and the questionnaire finalized.

The questionnaire was designed to be administered to mothers of children under 24 months of age and was composed of 50 questions. Questions 1-3 dealt with demographic data. Questions 4-6 covered income generation activities. Questions 7-11 covered infant feeding (knowledge and practice) and 12 and 13 covered Vitamin A knowledge. Questions 14-23 dealt with diarrheal disease control (knowledge and practice). Questions 24-28 covered respiratory infections (knowledge and practice). Questions 29 and 30 dealt with the control of malaria. Questions 31 and 32 collected information on growth monitoring. Questions 33-38 covered immunization coverage and knowledge, and questions 39-50 dealt with maternal care activities: prenatal care, family planning, delivery assistance and nutrition during pregnancy.

A sample of the questionnaire is shown in Appendix A.

B. Determination of Sample Size

Sample size was calculated using the following formula:

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

where n = sample size; z = statistical certainty chosen; p = estimated prevalence/coverage rate; $q = 1 - p$; and d = degree of precision.

The p value was defined by the coverage rate that requires the largest sample size ($p = 0.5$). The margin of error or d value was set at 0.1. The statistical certainty chosen was 95% ($z = 1.96$). The resulting sample size needed (n) was determined to be:

$$\begin{aligned} n &= (1.96 \times 1.96) (.5 \times .5) / (.1 \times .1) \\ n &= (3.84) (.25) / .01 \\ n &= 96 \end{aligned}$$

In order to compensate for bias which enters the survey from interviewing persons in clusters (rather than randomly selecting 96 persons), the sample size of 96 should be doubled. However, experience has shown that a minimum sample of 210 (7 per cluster) should be used with the given values of p , d and z . To further eliminate bias and to take into account possible non-respondents, the sample size of 270 was chosen (9 per cluster).

Ninety-five percent Confidence Limits for some of the survey results were calculated using the following formula:

$$p \pm z[\text{square root of } (pq/n)]$$

where p = proportion of survey population; z = statistical certainty (for 95%, $z = 1.96$); $q = 1 - p$; and n = sample size.

EXAMPLE: If the proportion of children in the survey who were immunized with measles vaccine is 61% and $n = 270$:

$$\begin{aligned} 95\% \text{ confidence limit} &= .61 \pm \text{square root of } [(.61 \times .39)/270] \\ &= .61 \pm .03 = .58 - .64 \end{aligned}$$

In other words, we are 95% sure that the actual proportion of children in the survey region who have measles vaccine is between 58% and 64%.

C. Selection of the Sample

The 30 cluster methodology was used, based on "probability proportionate to size", taking a community as a cluster site. The list of communities, with their respective population sizes, was used to draw the sample. The sampling interval was calculated by dividing the total population by 30. Two communities fell within the sampling interval for the first cluster. These two communities were then written on two pieces of paper and then one was randomly selected out of a bowl. The sampling frame is shown in Appendix C.

The starting point for each cluster was determined in the following manner for small communities: the center of the community was located and a random direction was selected. The first household encountered in the randomly chosen direction was the starting point. The second and subsequent households were the ones which were nearest to the previous household.

In each cluster, 9 mothers were interviewed. In cases where the mother was not available at the time of the interview, an older child was interviewed if he/she knew the practices of the mother. If not, another household was chosen (the household nearest to the last). In the case where there were two children under 24 months, the mother was questioned on the younger child.

D. Training of Supervisors and Interviewers

The WRC Nicaragua staff had selected five supervisors and 12 interviewers prior to the training. Three days of training were given to the supervisors and interviewers by Dr. Orestes Zuniga, the WRC Honduras CS Director. The trainer also acted as a supervisor during data collection in certain instances.

On the morning of the first day of training, supervisors were trained in the following: a) purpose of the survey, b) selection of sample size and c) the role of the supervisor. In the afternoon of the first day, both supervisors and interviewers were included. The subjects covered were: a) purpose of the investigation, b) detailed review of the questionnaire and c) interviewing techniques.

Both supervisors and interviewers were present for the second day of training. The second day was devoted to: a) the roles of supervisors and interviewers, b) role plays and c) discussion.

On the morning of the third day of training, a pilot test of the survey questionnaire was conducted in Acoyapa, Nicaragua which was an area near the training site and not one of the clusters selected. Each interviewer conducted three interviews for the pilot test. Following the pilot, a debriefing session was held to deal with any questions that had arisen, to make any final changes to the questionnaire and to re-emphasize important points in preparation for data gathering the following day.

E. The Interviews

The data collection was conducted over five days and 270 mothers with children under two were interviewed. The average interview was completed in 20 to 30 minutes. It was necessary to substitute four of the cluster sites with the next nearest site due to heavy rains and impassible roads, bridges and waterways. For example, the project had arranged to use horses, but when they reached the areas, the mud was waist deep. The horses would not have been able to pass into the region. In addition, a boat was required to reach one of the islands, but as the weather in this region is very stormy, the boat went off course to a deserted island. The interviewers were too afraid to try again.

Consideration was given to the fact that many people were usually present in the home when the interview was given. In order to avoid others from interfering and influencing the mother's answers, mothers were asked if they could be questioned in private.

In order to ensure that the interviewers were conducting the interviews correctly, the supervisors were present at one interview each day.

F. Method of Data Analysis

Data analysis was performed in two different ways: through hand tabulation and with use of the computer. The hand tabulation allowed all of the field staff involved in the survey to understand completely all of the steps in the survey process. The computer was used to perform a more refined data analysis with cross tabulations.

The hand tabulation was performed by nine pairs of the supervisors and interviewers who conducted the survey. Questionnaires from each cluster were passed to each group, who tabulated one question at a time. The WRC headquarters Administrative Coordinator and the WRC Nicaragua Program Coordinator supervised this process.

The computerized data entry was carried out on one computer by bilingual data entry personnel who were trained by the Administrative Coordinator and Program Coordinator. EPI INFO 5.1b was used for the analysis, and frequencies and cross tabulations were performed.

III. SURVEY RESULTS

The following answers were given for the 50 questions. Twelve questionnaires were removed from the analysis due to answers that were left blank. Therefore, the number of surveys analyzed was n = 258.

Demographic Data

1. Ages of the mothers were as follows:

AGEMOTHER	Freq	Percent	Cum.
15	3	1.2%	1.2%
16	7	2.7%	3.9%
17	12	4.7%	8.5%
18	20	7.8%	16.3%
19	11	4.3%	20.5%
20	12	4.7%	25.2%
21	12	4.7%	29.8%
22	17	6.6%	36.4%
23	13	5.0%	41.5%
24	17	6.6%	48.1%
25	12	4.7%	52.7%
26	12	4.7%	57.4%
27	11	4.3%	61.6%
28	12	4.7%	66.3%
29	8	3.1%	69.4%
30	20	7.8%	77.1%
31	4	1.6%	78.7%
32	6	2.3%	81.0%
33	8	3.1%	84.1%
34	3	1.2%	85.3%
35	12	4.7%	89.9%
36	4	1.6%	91.5%
37	6	2.3%	93.8%
38	2	0.8%	94.6%
39	4	1.6%	96.1%
40	1	0.4%	96.5%
41	2	0.8%	97.3%
42	3	1.2%	98.4%
43	2	0.8%	99.2%
45	1	0.4%	99.6%
47	1	0.4%	100.0%
Total	258	100.0%	

Sum = 6706.00; Mean = 25.99; Standard deviation = 6.91

The mean age of mothers in the survey was 26. Mothers considered high risk for births are those <18 and >35 or 23.3% of this population.

2. Ages of the children surveyed were as follows:

AGECHILD	Freq	Percent	Cum.
0	12	4.7%	4.7%
1	17	6.6%	11.2%
2	11	4.3%	15.5%
3	9	3.5%	19.0%
4	12	4.7%	23.6%
5	18	7.0%	30.6%
6	11	4.3%	34.9%
7	11	4.3%	39.1%
8	9	3.5%	42.6%
9	13	5.0%	47.7%
10	17	6.6%	54.3%
11	14	5.4%	59.7%
12	11	4.3%	64.0%
13	8	3.1%	67.1%
14	15	5.8%	72.9%
15	10	3.9%	76.7%
16	3	1.2%	77.9%
17	7	2.7%	80.6%
18	12	4.7%	85.3%
19	6	2.3%	87.6%
20	8	3.1%	90.7%
21	10	3.9%	94.6%
22	5	1.9%	96.5%
23	9	3.5%	100.0%
Total	258	100.0%	

Sum = 2640.00
 Mean = 10.23
 Standard deviation = 6.69

The mean age of children in the survey was 10.2 months with 154 children 0-11 months (59.7%) and 104 children 12-23 months (40.3%).

3. Literacy: A total of 104 (40.3%) of the mothers replied that they had a primary education and could read, and 49 (19.0%) of the mothers had a secondary education or higher. Thus, the literacy rate of the sample was 59.3%, while the percent of mothers who were illiterate was 40.7%.

Income Generation

4. Do you do any "income generating work"? n = 258
(multiple answers possible).

	n	%
a. nothing	201	77.9
b. sewing	0	0.0
c. selling agricultural products	7	2.7
d. selling prepared foods (bread, nacatamales, vaho, etc.)	14	5.4
e. servant	5	1.9
f. selling clothes (new or used)	2	.8
g. salaried worker	26	10.1
h. other	2	.8

5. Do you do this work inside or outside of your house? n = 57

	n	%
1. in the house	34	59.6
2. outside the house	23	40.4

6. Who cares for (name of child) while you work outside your house? (multiple answers possible) n = 23

	n	%
a. mother takes child with her	4	17.4
b. husband/partner	5	21.7
c. older children	7	30.4
d. relatives	10	43.5
e. neighbors/friends	3	13.0
f. maid	4	17.4
g. other	0	0.0

Breastfeeding/Infant Feeding

Feeding practices (in percents) for each age group, by type of food given were as follows:

AGE GROUP: 1=0-3 months; 2=4-6 months; 3=7-9 months;
 4=10-12 months; 5=13-15 months; 6=16-18 months;
 7=19-21 months; 8=22-23 months

AGE GROUP	1	2	3	4	5	6	7	8
Breast feed	84	76	70	64	39	32	25	29
Bottle milk	74	71	79	67	76	68	75	71
Water/Tea/Cof	71	95	100	100	94	96	96	93
Semisolid	37	56	55	45	61	36	63	71
Fruit juice	20	66	49	64	70	50	75	86
Vitamin A	10	46	39	57	61	64	58	71
GLV's	0	7	3	5	9	0	13	7
Meat/Fish	8	39	52	76	85	86	79	93
Beans/Nuts	12	44	76	91	82	86	92	93
Eggs/Cheese	8	51	82	88	85	82	100	93
Add sugar	67	68	91	95	91	86	88	86
Add fat	12	44	82	93	100	96	96	93

7. Are you breastfeeding (name of child)? n = 258

	n	%
1. yes	152	58.9
2. no	106	41.1
(95% C.L. = 0.53 - 0.65)		

8. Have you ever breast-fed (name of child)? n = 106

	n	%
1. yes	86	81.1
2. no	20	18.9

9. After the delivery, when did you breast-feed (name of child) for the first time? n = 258

	n	%
1. during the first hour after delivery	109	45.8
2. from 1 to 8 hours after delivery	36	15.1
3. more than 8 hours after delivery	91	38.2
4. do not remember	2	.8

Thus, 60.9% of the mothers started breastfeeding their children in the first 8 hours, while 38.2% first breastfed their children more than 8 hours after delivery.

The sample size for question 10 is equal to 258. Only the yes responses are shown below. The proportions given are in relation an n of 258.

10. a. Are you giving (name of child) water, teas or coffee?

	n	%
1. yes	237	91.9

b. Are you giving (name of child) bottlemilk?

	n	%
1. yes	187	72.5

c. Are you giving (name of child) semisolid foods such as atoles or pures?

	n	%
1. yes	131	50.8

d. Are you giving (name of child) fruits or juices?

	n	%
1. yes	144	55.8

e. Are you giving (name of child) carrots, squash, mangos or papaya?

	n	%
1. yes	119	46.1

f. Are you giving (name of child) green leafy vegetables such as beet, yucca or radish greens?

	n	%
1. yes	13	5.0

g. Are you giving (name of child) meat or fish?

	n	%
1. yes	148	57.4

- h. Are you giving (name of child) beans or nuts such as peanuts?
- | | n | % |
|--------|-----|------|
| 1. yes | 168 | 65.1 |
- i. Are you giving (name of child) eggs, cheese or cream?
- | | n | % |
|--------|-----|------|
| 1. yes | 172 | 66.7 |
- j. Are you adding sugar or honey to (name of child's) meals?
- | | n | % |
|--------|-----|------|
| 1. yes | 213 | 82.6 |
- k. Are you adding oil or fat (lard) to (name of child's) meals?
- | | n | % |
|--------|-----|------|
| 1. yes | 180 | 69.8 |

The frequency of exclusive breastfeeding of children 0-3 months was 12.2% as shown in the table below:

EXCLUSBF	Freq	Percent	Cum.
yes	6	12.2%	12.2%
no	43	87.8%	100.0%
Total	49	100.0%	

11. When should a mother start adding foods to breastfeeding?
n = 258

	n	%
1. start adding earlier than 4 months	114	44.2
2. start adding between 4 and 6 months	73	28.3
3. start adding 6 months or later	48	18.6
4. doesn't know	23	8.9

Vitamin A

12. Which vitamin helps you prevent "night blindness"?
n = 258

	n	%
1. Vitamin A	16	6.2
2. doesn't know or other	242	93.8

13. Which foods contain vitamin A to prevent "night blindness"?
(multiple answers possible) n = 258

	n	%
a. doesn't know or other	180	69.8
b. green leafy vegetables	20	7.8
c. yellow or orange fruits	24	9.3
d. liver/small fish/meat	27	10.5
e. breastmilk	5	1.9
f. egg yolks	18	7.0

Diarrheal Diseases

14. Has (name of child) had diarrhea during the last two weeks?
n = 258

	n	%
1. yes	68	26.4

(95% C.L. 0.21 - 0.31)

15. During (name of child's) diarrhea, did you breastfeed...
n = 68

	n	%
1. more than usual	10	14.7
2. same as usual	29	42.6
3. less than usual	14	20.6
4. stopped completely	2	2.9
5. child not breastfed	13	19.1

16. During (name of child's) diarrhea, did you provide (name of child) with fluids other than breastmilk? n = 68

	n	%
1. more than usual	10	14.7
2. same as usual	25	36.8
3. less than usual	15	22.1
4. stopped completely	12	17.6
5. exclusively breastfeeding	6	8.8

17. During (name of child's) diarrhea, did you provide (name of child) with solid/semisolid foods? n = 68

	n	%
1. more than usual	2	2.9
2. same as usual	17	25.0
3. less than usual	16	23.5
4. stopped completely	22	32.4
5. exclusively breastfeeding	11	16.2

18.	When (name of child) had diarrhea, what treatments did you use? (multiple responses possible) n = 68		
		n	%
	a. nothing	12	17.6
	b. ORS	19	27.9
	c. sugar-salt solution	7	10.3
	d. infusions or other fluids	6	8.8
	e. anti-diarrheal medicines or antibiotics	26	38.2
	f. other	2	2.9
19.	When (name of child) had diarrhea, did you seek advice or treatment for the diarrhea? n = 68		
		n	%
	1. yes	34	50.0
	2. no	34	50.0
20.	From whom did you seek advice or treatment for the diarrhea of (name of child)? (multiple answers possible) n = 34		
		n	%
	a. general hospital	2	5.9
	b. health center/health post	22	64.7
	c. private clinic/doctor	0	0.0
	d. pharmacy	0	0.0
	e. volunteer health worker (URO)	2	5.9
	f. traditional healer	0	0.0
	g. traditional birth attendant	1	2.9
	h. relatives or friends	7	20.6
	i. other	0	0.0
21.	What signs/symptoms would cause you to seek advice or treatment for (name of child's) diarrhea? n = 258 (multiple answers possible)		
		n	%
	a. doesn't know	77	29.8
	b. vomiting	63	24.4
	c. fever	46	17.8
	d. dry mouth, sunken eyes, sunken fontanelle, decreased urination (dehydration)	44	17.1
	e. diarrhea of prolonged duration (at least 14 days)	41	15.9
	f. blood in stool	6	2.3
	g. loss of appetite	23	8.9
	h. weakness	7	2.7
	i. other	12	4.7

22. What are the most important actions you should take if (name of child) has diarrhea? (multiple answers possible) n = 258

	n	%
a. doesn't know	13	5.0
b. initiate fluids quickly	41	15.9
c. give the child more to drink than usual	4	1.6
d. prepare and administer ORT	110	42.6
e. give the child smaller, more frequent feeds	4	1.6
f. take the child to the general hospital/health center	94	36.4
g. give the child more food than usual when recuperating from diarrhea for catch up growth	0	0.0
h. other	18	7.0

23. What are important actions a mother should take when a child is recovering from diarrhea? (multiple answers possible) n = 258

	n	%
a. doesn't know	41	15.9
b. give the child smaller, more frequent feeds	106	41.1
c. give the child more foods than usual	30	11.6
d. give the child foods with high caloric content	8	3.1
e. give the child less quantity of food	48	18.6
f. other	37	14.3

Respiratory Illness

24. Has (name of child) been ill with cough or difficult breathing in the last two weeks? n = 258

	n	%
1. yes	130	50.4

25. Has (name of child) experienced rapid and difficult breathing when ill? n = 130

	n	%
1. yes	104	80.0

The children who had the signs/symptoms listed in questions 24 and 25 will be considered to have acute lower respiratory infections. Thus, out of the total sample (258), 104 or 40.3% of the children in the survey had acute lower respiratory infections in the last two weeks. The 95% C.L. for this proportion is 0.34 - 0.46.

26. Did you seek advice or treatment for (name of child) when ill with these respiratory problems? n = 104

	n	%
1. yes	64	61.5

27. From whom did you seek advice or treatment for (name of child) when ill with these respiratory problems? n = 64
(multiple answers possible)

	n	%
a. general hospital	7	10.7
b. health center/health post	45	70.3
c. private clinic/doctor	3	4.7
d. pharmacy	0	0.0
e. volunteer health worker	2	3.1
f. traditional healer	0	0.0
g. traditional birth attendant	2	3.1
h. relatives or friends	10	15.6
i. other	0	0.0

28. What are the signs/symptoms of respiratory infection that would cause you to take (name of child) to a health facility? (multiple answers possible) n = 244

	n	%
a. doesn't know	58	23.8
b. rapid or agitated breathing	121	49.6
c. chest indrawing	23	9.4
d. loss of appetite	13	5.3
e. fever	39	16.0
f. cough	45	18.4
g. other	14	5.7

Question 28 has a sample size of 244 rather than 258 due to an error on the questionnaire during the first day of data collection. The error was corrected for second through fourth day of the interview. In spite of the 14 missing responses, it is felt that the information given is accurate and gives a good measurement of what percent of the mothers in the project area know the signs/symptoms of acute lower respiratory infection.

Malaria Control

29. What are you doing to prevent getting malaria? n = 258
(multiple responses possible)

	n	%
a. nothing	64	24.8
b. bednet	123	47.7
c. mosquito coils or repellent	20	7.8
d. drain swamps and water collection areas	22	8.5
e. taking anti-malarial medication	63	24.4
f. fumigate	10	3.9
g. other	6	2.3

A cross tabulation was done for mothers using at least one of three malaria prevention methods that will be promoted by the CSP (bed-nets, drainage of water collection sites, malaria prophylaxis). In Rio San Juan 69.9% of the mothers used at least one of these methods.

30. What signs or symptoms of malaria would cause you to go to the health center? (multiple answers possible) n = 258

	n	%
a. doesn't know	54	20.9
b. fever	185	71.7
c. chills	91	35.3
d. headache	51	19.8
e. delirium	8	3.1
f. vomiting	30	11.6
g. pallor	20	7.8
h. weakness	9	3.5
i. other	4	1.6

Growth Monitoring

31. Does (name of child) have a growth monitoring card? n = 258

	n	%
1. yes	172	66.7
2. no, lost it	51	19.8
3. no, never had one	35	13.6

32. Children who have been weighed in the last three months? (according to the growth card) n = 172

	n	%
1. yes	127	73.8

Immunizations

33. Has (name of child) ever received any immunizations? n = 258

	n	%
1. yes	226	87.6
2. no	31	12.0
3. doesn't know	1	.4

34. At what age should (name of child) receive measles vaccine?

MONTHS	Freq	Percent	Cum.
0	1	0.4%	0.4%
1	11	4.3%	4.7%
2	10	3.9%	8.5%
3	18	7.0%	15.5%
4	3	1.2%	16.7%
5	6	2.3%	19.0%
6	11	4.3%	23.3%
7	2	0.8%	24.0%
8	6	2.3%	26.4%
9	46	17.8%	44.2%
10	4	1.6%	45.7%
12	17	6.6%	52.3%
24	3	1.2%	53.5%
36	1	0.4%	53.9%
84	1	0.4%	54.3%
99 (doesn't know)	118	45.7%	100.0%
Total	258	100.0%	

35. Do you have an immunization card for (name of child)? n = 258

	n	%
1. yes	187	72.5
2. no, lost it	44	17.1
3. no, never had one	27	10.5

Immunization coverages for children 12-23 months (n = 104) are as follows:

	n	%
BCG	59	56.7
DPT1	70	67.3
DPT2	63	60.6
DPT3	55	52.9
OPV1	71	68.3
OPV2	57	54.8
OPV3	57	54.8
MEASLES	52	50.0
Fully immunized	39	37.5
Dropout rate (DPT1-DPT3/DPT1)		21.4

37. Can you tell me the main reason why a pregnant woman needs to be vaccinated with tetanus toxoid vaccine? n = 258

	n	%
1. to protect both mother/newborn against tetanus	86	33.3
2. to protect only the woman against tetanus	24	9.3
3. to protect only the baby against tetanus	73	28.3
4. doesn't know or other	75	29.1

38. How many tetanus toxoid injections does a pregnant woman need to protect the newborn from tetanus? n = 258

	n	%
1. one	31	12.0
2. two	58	22.5
3. more than two	77	29.8
4. none	5	1.9
5. doesn't know	87	33.7

Maternal Care

39. Do you have a prenatal care card? n = 258

	n	%
1. yes	67	26.0
2. no, lost it	137	53.1
3. no, never had one	54	20.9

40. Look at the prenatal care card and record the number of TT vaccinations in the space below: n = 67

	n	%
1. one	21	31.3
2. two or more	29	43.3
3. none	17	25.4

41. Look at the card and record the number of prenatal visits she had. n = 67

	n	%
1. one	8	11.9
2. two	56	83.6
3. none	3	4.5

42. Are you pregnant now? n = 258

	n	%
1. yes	28	10.9
2. no	230	89.1

43. Do you want another child in the next two years? n = 230

	n	%
1. yes	46	20.0
2. no	167	72.6
3. doesn't know	17	7.4

44. Are you or your husband using a method to not get pregnant?
n = 184

	n	%
1. yes	76	41.3

45. What is the method that you or your husband is using to avoid getting pregnant? n = 76

	n	%
1. tubal ligation	11	14.5
2. vasectomy	0	0.0
3. injections	0	0.0
4. pills	37	48.7
5. IUD	17	22.4
6. barrier method/diaphragm	1	1.3
7. condom	2	2.6
8. foam/gel	0	0.0
9. exclusive breastfeeding	4	5.3
10. rhythm	2	2.6
11. abstinence	2	2.6
12. withdrawal	0	0.0
13. other	0	0.0

Modern contraceptive prevalence (includes methods 1-8): 37.0%
(95% C.L. = .30 - .44) (The denominator does not include pregnant women or women who do not want another child in the next two years.)

46. When you were pregnant with (name of child) did you visit a health center (clinic or hospital) or see a TBA for prenatal care? n = 258

	n	%
1. yes	215	83.3

47. How soon after a woman knows she is pregnant should she go to a health center or see a TBA? n = 258

	n	%
1. doesn't know	52	20.2
2. first trimester, 1-3 months	174	67.4
3. middle trimester, 4-6 months	24	9.3
4. last trimester, 7-9 months	2	0.8
5. at the time of delivery	5	1.9
6. no need to see the health worker	0	0.0
7. other	1	0.4

48. What foods are good for a pregnant woman to eat to prevent a woman from becoming pale and weak? (multiple answers possible) n = 258

	n	%
a. doesn't know	110	42.6
b. vegetables rich in iron like beet, yucca or radish leaves	53	20.5
c. meat, fish, eggs	93	36.0
d. other	36	14.0

49. During your pregnancy with (name of child) was the amount of food you ate... n = 258

	n	%
1. more than usual	70	27.1
2. same as usual	102	39.5
3. less than usual	84	32.6
4. doesn't know	2	.8

50. At the delivery of (name of child), who tied and cut the cord? n = 258

	n	%
1. yourself	5	1.9
2. family member	39	15.1
3. traditional birth attendant	81	31.4
4. health professional (physician or nurse)	128	49.6
5. doesn't know	3	1.2
6. other	2	.8

IV. DISCUSSION AND RECOMMENDATIONS

Age Distribution

Determining the exact ages for both mothers and their children did not seem to be a problem in this project area. Birth registration is required for many official documents and is recorded on the immunization, growth monitoring and prenatal care cards.

Mother's ages fell primarily between 17-30 years of age (73%) with a mean age of 26. Forty-eight (18.6%) of the mothers were under 18 or over 35, which is considered high risk for childbirth. There were 154 children between 0-11 months (60%) and 104 children 12-23 months (40%) with a mean age of 10.2 months. The fact that a lower percentage of children 12-23 are represented by the survey may be due to the fact that when there were two children in the home under two, the younger of the two children was systematically selected.

Education/Income Generation

The results show that 41% of the women interviewed are illiterate and 59% have some level of literacy. Thus, the promotion of health messages must be given primarily through graphics and participative techniques. Posters may contain simple wording for the percentage of mothers that are literate [most (70%) of these have only a primary education], but should also contain graphics for the mothers who are illiterate.

Twenty-two percent of the women surveyed work, with 40% of these working outside of the home. A high percentage (54%) of the women who worked had salaried positions, while 25% sell prepared foods and 12% sell agricultural products. Of the children whose mothers work away from the home, the majority are cared for by a relative or an older sibling. However, since the sample of women working away from the home was very small, this only reveals a trend, but may indicate that health messages should be addressed to other family members, as well as the mother.

Breastfeeding/Infant Feeding Practices

Although at some point 92% of the mothers surveyed had breastfed their children, only 59% of the mothers surveyed were breastfeeding their children at the time of the survey. Therefore, 41% of the sample of children under two were not being breastfed. The table on page 12 shows that breastfeeding levels steadily decline as the children age. Consequently, health messages given by project staff should emphasize the continuance of breastfeeding until the child is two years of age.

In addition, the importance of exclusive breastfeeding until four months will need to be a priority health message for Rio San Juan

since only 12% of mothers exclusively breastfeed their children 0-3 months. The survey also revealed that 38% of children are not breastfed in the first 8 hours after birth. One possible reason why they may not be breastfeeding immediately after birth may be that they discard the colostrum considering it to be "dirty milk". In addition, 44% of mothers believe that they should be giving their child solid/semisolid foods before four months and 74% give their children bottlemilk, water (71%) or sugar/honey (67%) before four months. Bottlefeeding percentages remain constant (74% to 71%), while breastfeeding percentages decrease remarkably (84% to 29%) as the children age. Special emphasis must be given in the project to discourage women from bottlefeeding. These issues will need to be researched further, possibly through focus groups to determine the reasons why breastfeeding is so low in this area.

Only 28% of the mothers surveyed knew to introduce foods at 4-6 months. Thus, project staff should encourage mothers to begin giving their children fruit juices, fruit and semisolid foods at this time.

Vitamin A

Increasing the knowledge of Vitamin A rich foods will need to be another priority health message, as only 6% of women know that Vitamin A prevents "night blindness" and only 30% know at least one food which contains Vitamin A. There is also evidence that only a small percentage of the mothers are actually giving Vitamin A rich foods to their children [i.e. green leafy vegetables (5%), breastmilk (59%), or mangoes, carrots, squash or papaya (46%)]. Since less than 14% of any of the age groups of children in table 3 were fed green leafy vegetables, it is possible that these are either not readily available, people do not know of their nutritional value, or there is some cultural reason why people do not eat GLVs. Thus, a market survey is recommended. If GLVs are not available or there is a cultural reason why they are not eaten, health messages should educate mothers to give their children Vitamin A rich foods such as mangoes, squash, carrots or papaya which are locally available.

Diarrheal Disease

Twenty-six percent of the mothers interviewed reported that their children had diarrhea in the previous two weeks. Of the children that had diarrhea, medication was given to 38%. Since 71% of those mothers sought treatment for their child's diarrhea from the hospital or health center and since none went to the pharmacy, we can conclude that many of the health staff at the MOH facilities are prescribing medications for diarrhea. Encouraging doctors and other health professionals to promote ORS rather than medications should be a focus of the project.

Another aspect of the CDD intervention that will need to be addressed is the amount of ORT and fluids given to children with diarrhea. Only 28% of mothers gave their children ORS and 10% gave the salt-sugar ORT solution (a total of 38%). This compares with the national rate of 40%. In addition, only 57% fed their children breastmilk in equal or greater amounts than usual and only 52% give their children an equal or greater amount of fluids. A full 40% of children were either given less fluids or fluids were stopped completely. This puts the child with diarrhea at great risk of dehydration and death since only 17% of the mothers interviewed knew the signs of dehydration.

Also, many of the children who do not die will be malnourished as only 28% of mothers fed their children an equal or greater amount during diarrhea and only 12% know to give the child more foods than usual during recovery.

The project must work hard to educate mothers, as well as health providers to change current knowledge and practices. Emphasis will be placed on training the mothers to give their children ORT, abundant fluids and foods during and after diarrhea. Training will also be given on the signs of dehydration.

Respiratory Illness

Forty percent of the mothers surveyed indicated that their children had acute lower respiratory infections in the last two weeks. Of these children, 53% were brought to a hospital, health center or doctor. One of the reasons for this may be that mothers do not know the signs and symptoms of acute lower respiratory infection. This was verified by the fact that half of the mothers did not know that rapid breathing or chest indrawing are signs of ALRI. Education on the signs and symptoms of ALRI should be a focus of this intervention in the project.

Malaria Control

Forty-eight percent of the population are using bed-nets as a form of malaria prevention, 24% are taking prophylactic medication and 9% are draining swamps or water collection areas. Seventy percent are using at least one of these methods. More research needs to be done on ways to encourage pregnant women to take malaria prophylaxis. Since the use of bednets is quite popular, emphasis will be given to this method to further increase the number of women and children who use bednets. Malaria prophylaxis and water draining should also be emphasized by the CS project. Most mothers knew that fever was a sign of malaria (72%), however, the CSP should educate mothers to take any child with a fever to the health center.

Growth Monitoring

Of the children surveyed, 67% had a growth chart and 74% of these had been weighed in the last 3 months (49% of the total population surveyed). The project will place special emphasis on weighing children 0-11 months bi-monthly and weighing children 12-35 months quarterly. The health information system used in this project will be helpful in tracking the children whose mothers reported never having a card or who lost their card.

Immunizations

Eighty-eight percent of mothers surveyed reported having had at least one immunization though the fully immunized percentage of children 12-23 months was only 38%. National immunization coverage rates are BCG--75%, DPT3--71%, OPV3--83%, and measles--54%. Immunization coverage rates as reported for this region by the Ministerio de Salud (MINSA) are as follows: BCG--57%; DPT3--77%; OPV3--77%; and measles--88%. The survey results, however, showed the following rates: BCG--56.7%; DPT3--53%; OPV3--55%; and measles--50%. Except for the BCG rate, the survey coverages proved to be much lower than the reported MINSA national or regional rates. The difference may be found in the 27.6% that either lost or never had a card who may have received immunizations. It may also be that immunizations given during the yearly campaigns were not recorded on the charts.

Though the individual coverages tended to be somewhat consistent, the fully immunized percentage for children 12-23 months was only 37.5% with a drop-out rate of 21%. This reveals that there were a high number of defaulters which could be due to a lack of access to immunizations or a lack of proper follow-up. Strategies to deal with these issues will be developed as the project unfolds.

Though the MINSA norm states that the measles vaccine be given at nine months, only a small percentage (18%) knew that nine months was the age at which a child should receive the measles vaccine. This demonstrates a need for a health message specifically about proper timing on the measles and possibly other vaccines.

Maternal Care

Though MINSA gives all women a separate prenatal care card for each pregnancy, the survey showed that only 26% had these cards during the survey, while 53% had lost theirs. Of those that had cards, 43% were fully immunized. Only 52% knew that a pregnant woman needs two or more tetanus toxoid injections to protect the newborn from tetanus. More education, therefore, needs to be done emphasizing the importance of women receiving TT.

The results revealed that a high percentage visited a health center or traditional birth attendant (TBA) for prenatal care (83%) and

84% of mothers with prenatal care cards received at least two prenatal care visits. A relatively high number also knew to go to a health center during the first trimester (67%). Although this seems to demonstrate that MINSA is emphasizing the need for prenatal care, it is difficult to draw significant conclusions as these percentages were based on the 26% of mothers that had prenatal cards. However, prenatal care, with an emphasis on a visit in the first trimester will continue to be a key focus of the educational program.

The educational program will also need to focus on educating mothers on the quantity and types of foods they should consume during pregnancy. Fifty-seven percent of the mothers didn't know which foods are good for a pregnant woman to eat to prevent anemia and only 27% ate more than usual during their pregnancy. The MINSA health message will need to be reinforced to ensure that women get proper nutrition during their pregnancy.

Of the 73% that were not pregnant and did not want to have another child in the next two years, only 37% were using a modern family planning method which is higher than the national contraceptive prevalence rate of 27%.¹⁰ However, this demonstrates that 63% of those not pregnant and not wanting another child in the next two years were not using a modern family planning method. The project will need to focus, therefore, on increasing the number of those women using modern methods of family planning through increased education and access to supplies. Focus groups will also be used to determine the reasons why this gap exists.

Thirty-one percent of the mothers reported that a TBA attended their delivery. Another 15% reported being attended by a family member. In many cases the TBA is probably also a family member. This is a significant percentage and therefore demonstrates a need for TBA training in this region.

V. Feedback Sessions

An initial feedback session was held with World Relief Nicaragua managerial staff upon the completion of the analysis.

A feedback session was also held on November 9 with four members of the staff from Development Associates, Inc. (a management unit for the A.I.D. PVO co-financing project) to discuss the methodology and results of the baseline. As a result of this session, a further session was held on December 1, 1992, in which several other A.I.D. registered PVO's as well as the directors of our local church counterparts, CAM and IDSAD were present.

Feedback sessions for the regional MINSA (Nicaragua Ministry of Health) personnel and the World Relief area coordinator were held.

The health promoters second training session included a review of the results and discussion was held with them as to implications for the project. The results have been used for discussion with the community health councils.

VI. SURVEY COSTS

Travel	1,068.79
Food and lodging	428.30
Supervisor and Interviewer per diem	1,080.19
Paper/production costs	66.04
Supplies	73.95
Expenses, Survey Trainers	<u>1,201.02</u>
TOTAL	3,918.29

Note: All expenses for Dr. Zuniga, except field expenses, were paid by Chatlos Foundation and are not included in the above expenses.

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APPENDIX A

Baseline Survey, 1992
Knowledge and Practice Study
Child Survival Project
World Relief/Nicaragua

The following questions are to be addressed to mothers with children less than two years (less than 24 months).

Interview date ___/___/92
dd/mm

Reschedule interview ___/___/92
dd/mm

Interviewer name _____
Supervisor _____

1. Name of mother _____ Age (years) ___
2. Name and age of the child under two years old _____
Birth date ___/___/___ Age in months _____
dd/mm/aa
Community _____

Mother's Education/Occupation

3. What was the highest educational level you attained?
 - a. none _____
 - b. primary and does not read _____
 - c. primary and reads _____
 - d. secondary or higher _____
4. Do you do any work that brings in an income?
(multiple answers possible).
 - a. none _____ (go to 7)
 - b. sewing _____
 - c. selling agricultural products _____
 - d. selling prepared foods (bread, nacamales, vaho, etc.) _____
 - e. maid _____
 - f. selling clothes (new or used) _____
 - g. salaried worker _____
 - h. other (specify) _____
5. Do you do this work inside or outside your home?
 - a. in the home _____ (go to 7)
 - b. outside the home _____

6. Who cares for (name of child) while you work outside your home? (multiple answers possible)
- a. mother takes child with her
 - b. husband/partner
 - c. older children
 - d. relatives
 - e. neighbors/friends
 - f. maid
 - g. other (specify) _____

Breastfeeding/Infant Feeding

7. Are you breastfeeding (name of child)?
- a. yes (go to 9)
 - b. no
8. Have you ever breast-fed (name of child)?
- a. yes
 - b. no (go to 10)
9. After the delivery, when did you breast-feed (name of child) for the first time?
- a. during the first hour after delivery
 - b. from 1 to 8 hours after delivery
 - c. more than 8 hours after delivery
 - d. do not remember
10. a. Are you giving (name of child) water, teas or coffee?
- 1. yes
 - 2. no
 - 3. don't know
- b. Are you giving (name of child) bottle milk?
- 1. yes
 - 2. no
 - 3. don't know
- c. Are you giving (name of child) semisolid foods such as atoles or pures?
- 1. yes
 - 2. no
 - 3. don't know
-
- d. Are you giving (name of child) fruits or juices?
- 1. yes
 - 2. no
 - 3. don't know

e. Are you giving (name of child) carrots, squash, mangos or papaya?

- 1. yes
- 2. no
- 3. don't know

f. Are you giving (name of child) green leafy vegetables such as beet, quelite, yucca or radish leaves?

- 1. yes
- 2. no
- 3. don't know

g. Are you giving (name of child) meat or fish?

- 1. yes
- 2. no
- 3. don't know

h. Are you giving (name of child) beans or nuts such as peanuts?

- 1. yes
- 2. no
- 3. don't know

i. Are you giving (name of child) eggs, cheese or cream?

- 1. yes
- 2. no
- 3. don't know

j. Are you adding sugar or honey to (name of child's) meals?

- 1. yes
- 2. no
- 3. don't know

k. Are you adding oil or fat (lard) to (name of child's) meals?

- 1. yes
- 2. no
- 3. don't know

11. When should a mother start adding foods to breastfeeding?

- a. start adding earlier than 4 months
- b. start adding between 4 and 6 months
- c. start adding 6 months or later
- d. doesn't know

12. Which vitamin helps you prevent "night blindness"?

- a. Vitamin A
- b. don't know or other

13. Which foods contain vitamin A to prevent "night blindness"?
(multiple answers possible)
- a. doesn't know or other
 - b. green leafy vegetables
 - c. yellow or orange fruits
 - d. liver/small fish/meat
 - e. breastmilk
 - f. egg yolks

Diarrheal Diseases

14. Has (name of child) had diarrhea during the last two weeks?
- a. yes
 - b. no (go to 21)
 - c. don't know (go to 21)
15. During (name of child's) diarrhea, did you breastfeed (read the choices to the mother)
- a. more than usual
 - b. same as usual
 - c. less than usual
 - d. stopped completely
 - e. child has never been breastfed
 - f. child is no longer breastfed
16. During (name of child's) diarrhea, did you provide (name of child) with fluids other than breastmilk (read the choices to the mother).....
- a. more than usual
 - b. same as usual
 - c. less than usual
 - d. stopped completely
 - e. exclusively breastfeeding
17. During (name of child's) diarrhea, did you provide (name of child) with solid/semisolid foods (read the choices to the mother).....
- a. more than usual
 - b. same as usual
 - c. less than usual
 - d. stopped completely
 - e. exclusively breastfeeding

18. When (name of child) had diarrhea, what treatments did you use?
(multiple responses possible)
- a. nothing
 - b. ORS
 - c. sugar-salt solution
 - d. liquids, teas or other fluids
 - e. anti-diarrheal medicines or antibiotics
 - f. other (specify) _____
19. When (name of child) had diarrhea, did you seek advice or treatment for the diarrhea?
- a. yes
 - b. no (go to 21)
20. From whom did you seek advice or treatment for the diarrhea of (name of child)? (If the mother answers "doctor", find out where she went or to which doctor she went.)
(multiple answers possible)
- a. general hospital
 - b. health center/health post
 - c. private clinic/doctor
 - d. pharmacy
 - e. volunteer health worker (URO)
 - f. traditional healer
 - g. traditional birth attendant
 - h. relatives or friends
 - i. other (specify) _____
21. What signs/symptoms would cause you to seek advice or treatment for (name of child's) diarrhea?
- a. doesn't know
 - b. vomiting
 - c. fever
 - d. dry mouth, sunken eyes, sunken fontanelle, decreased urination (dehydration)
 - e. diarrhea of prolonged duration (at least 14 days)
 - f. blood in stool
 - g. loss of appetite
 - h. weakness
 - i. other _____

22. What are the most important actions you should take if (name of child) has diarrhea?
- a. doesn't know
 - b. initiate fluids quickly
 - c. give the child more to drink than usual
 - d. prepare and administer ORT
 - e. give the child smaller, more frequent feedings
 - f. take the child to the general hospital/health center
 - g. give the child more food than usual when recuperating from diarrhea for catch up growth
 - h. other (specify) _____

23. What are important actions a mother should take when a child is recovering from diarrhea? (multiple answers possible)
- a. doesn't know
 - b. give the child smaller, more frequent feedings
 - c. give the child more foods than usual
 - d. give the child foods with high caloric content
 - e. give the child less quantity of food
 - f. other (specify) _____

Respiratory Illness

24. Has (name of child) been ill with cough or difficult breathing in the last two weeks?
- a. yes
 - b. no (go to number 28)
25. Has (name of child) experienced rapid and difficult breathing when ill?
- a. yes
 - b. no (go to 28)
 - c. don't know (go to 28)
26. Did you seek advice or treatment for (name of child) when ill with cough or difficulty in breathing?
- a. yes
 - b. no (go to 28)

27. From whom did you seek advice or treatment for (name of child) when ill with these respiratory problems? (multiple answers possible)(If the mother answers doctor, ask where she went or to which doctor she went.)

- a. general hospital _____
- b. health center/health post _____
- c. private clinic/doctor _____
- d. pharmacy _____
- e. volunteer health worker _____
- f. traditional healer _____
- g. traditional birth attendant _____
- h. relatives or friends _____
- i. other (specify) _____

28. What are the signs/symptoms of respiratory infection that would cause you to take (name of child) to a health facility? (multiple answers possible)

- a. doesn't know _____
- b. rapid or agitated breathing _____
- c. chest indrawing _____
- d. loss of appetite _____
- e. fever _____
- f. cough _____
- g. other (specify) _____

Malaria Control

29. What are you doing to prevent getting malaria? (multiple answers possible)

- a. nothing _____
- b. bednet _____
- c. mosquito coils or repellent _____
- d. drain swamps and water collection areas _____
- e. taking anti-malarial medication _____
- f. other (specify) _____

30. What signs or symptoms of malaria would cause you to go to the health center? (multiple answers possible)

- a. doesn't know _____
- b. fever _____
- c. chills _____
- d. headache _____
- e. delirium _____
- f. vomiting _____
- g. pallor _____
- h. weakness _____
- i. don't think it's necessary to go to the center _____
- j. other (specify) _____

Growth Monitoring

31. Does (name of child) have a growth monitoring card?
a. yes _____
b. no, lost it _____ (go to 33)
c. no, never had one _____ (go to 33)
32. Look at the growth monitoring card of the child and record the following:
Has the child been weighed in the last three months?
a. yes _____
b. no _____

Immunizations

33. Has (name of child) ever received any immunizations?
a. yes _____
b. no _____
c. don't know _____
34. At what age should (name of child) receive measles vaccine?
a. specify in months _____
b. don't know _____
35. Do you have an immunization card for (name of child)?
a. yes _____ (ask that they show it)
b. no, lost it _____ (go to 37)
c. no, never had one _____ (go to 37)
36. Look at the immunization card and write down the dates of the immunizations in the spaces below.

		Day/Month/Year
BCG		_____
Polio	1st	_____
	2nd	_____
	3rd	_____
	4th	_____
	5th	_____
DPT	1st	_____
	2nd	_____
	3rd	_____
Measles		_____

37. Can you tell me the main reason why a pregnant woman needs to be vaccinated with tetanus toxoid vaccine?
- a. to protect both mother/newborn against tetanus
 - b. to protect only the woman against tetanus
 - c. to protect only the baby against tetanus
 - d. doesn't know or other
38. How many tetanus toxoid injections does a pregnant woman need to protect the newborn from tetanus?
- a. one
 - b. two
 - c. more than two
 - d. none
 - e. doesn't know

Maternal Care

39. Do you have a prenatal care card?
- a. yes
 - b. no, lost it (go to 40)
 - c. no, never had one (go to 40)
40. Look at the prenatal care card and record the number of TT vaccinations in the space below:
- a. one
 - b. two or more
 - c. none
41. Look at the prenatal care card and record the number of prenatal visits the mother had.
- a. one
 - b. two
 - c. none
42. Are you pregnant now?
- a. yes (go to 46)
 - b. no
 - c. don't know
-
43. Do you want another child in the next two years?
- a. yes (go to 46)
 - b. no
 - c. doesn't know

44. Are you or your husband using a method to avoid/postpone getting pregnant?
 a. yes _____
 b. no _____ (go to 46)
45. What is the method that you or your husband is using to avoid getting pregnant?
 (multiple answers possible)
- a. tubal ligation _____
 - b. vasectomy _____
 - c. injections _____
 - d. pills _____
 - e. IUD method _____
 - f. diaphragm _____
 - g. condom _____
 - h. foam/gel _____
 - i. exclusive breastfeeding _____
 - j. rhythm _____
 - k. abstinence _____
 - l. withdrawal _____
 - m. other _____
46. When you were pregnant with (name of child) did you visit a health center (clinic or hospital) or see a TBA for prenatal care?
 a. yes _____
 b. no _____
47. How soon after a woman knows she is pregnant should she go to a health center or see a TBA?
 a. don't know _____
 b. first trimester, 1-3 months _____
 c. middle of pregnancy, 4-6 months _____
 d. last trimester, 7-9 months _____
 e. at the time of delivery _____
 f. no need to see the health worker _____
 g. other (specify) _____
48. What foods are good for a pregnant woman to eat to prevent pregnancy anemia?
 (multiple answers possible)
- a. doesn't know _____
 - b. vegetables rich in iron like beet,
 yucca or radish leaves _____
 - c. meat, fish, eggs _____
 - d. other (specify) _____

49. During your pregnancy with (name of child) was the amount of food you ate...

- a. more than usual
- b. same as usual
- c. less than usual
- d. doesn't know

50. At the delivery of (name of child), who tied and cut the cord?

- 1. yourself
- 2. family member
- 3. traditional birth attendant
- 4. health professional (physician or nurse)
- 5. doesn't know
- 6. other (specify) _____

g. otro (especifique) -

Lactancia Materna

7. ¿Está dándole de mamar a (nombre del niño)?
a. sí - (pase a la 9)
b. no -
8. ¿Le ha dado de mamar a (nombre del niño) anteriormente?
a. sí -
b. no - (pase a la 10)
9. Después del parto, cuándo le dio de mamar por primera vez a (nombre del niño)?
a. durante la primera hora después del parto -
b. durante las primeras 8 horas después del parto -
c. más de 8 horas después del parto -
d. no se acuerda -
10. a. ¿Le está dando agua, té o café a (nombre del niño)?
1. sí -
2. no -
3. no sabe -
- b. ¿Le está dando leche en pacha a (nombre del niño)?
1. sí -
2. no -
3. no sabe -
- c. ¿Le está dando atoles o purés a (nombre del niño)?
1. sí -
2. no -
3. no sabe -
- d. ¿Le está dando frutas o jugos a (nombre del niño)?
1. sí -
2. no -
3. no sabe -
- e. ¿Le está dando zanahorias, ayote, mangos o papaya a (nombre del niño)?
1. sí -
2. no -
3. no sabe -
- f. ¿Le está dando vegetales verdes como la hoja de remolacha, de quelite, de yuca o de rábano a (nombre del niño)?
1. sí -
2. no -
3. no sabe -
- g. ¿Le está dando carne o pescado a (nombre del niño)?
1. sí -
2. no -
3. no sabe -

- h. ¿Le está dando frijoles o nueces como el maní a (nombre del niño)?
1. sí
 2. no
 3. no sabe
- i. ¿Le está dando huevos, cuajada o crema a (nombre del niño)?
1. sí
 2. no
 3. no sabe
- j. ¿Le está añadiendo azúcar o miel a los alimentos de (nombre del niño)?
1. sí
 2. no
 3. no sabe
- k. ¿Le está añadiendo aceite o manteca a los alimentos de (nombre del niño)?
1. sí
 2. no
 3. no sabe
11. ¿Cuándo debería empezar la madre a dar otros alimentos, además de su pecho?
- a. empezar antes de los 4 meses
 - b. empezar de los 4 a 6 meses
 - c. empezar a los 6 meses o después
 - d. no sabe
12. ¿Qué vitamina le ayuda a prevenir la "ceguera nocturna"?
- a. Vitamina A
 - b. no sabe u otro
13. ¿Qué comidas contienen Vitamina A para prevenir la "ceguera nocturna"? (puede marcar más de una respuesta)
- a. no sabe u otro
 - b. vegetales de hoja color verde-oscuro
 - c. frutas de pulpa amarilla o anaranjado intenso
 - d. hígado, pescado, carne
 - e. leche materna
 - f. yemas de huevo

Enfermedades Diarréicas

14. ¿Ha tenido (nombre del niño) diarrea en las dos últimas semanas?
- a. sí
 - b. no (pase a la 21)
 - c. no sabe (pase a la 21)
15. Durante la diarrea de (nombre del niño), ¿le dio pecho, ... (lea las opciones a la madre)
- a. más de lo que normalmente le da

- b. igual a lo que normalmente le da --
 c. menos de lo que normalmente le da --
 d. dejó de darle completamente --
 e. nunca le ha dado pecho --
 f. ya no recibía pecho --
16. Durante la diarrea de (nombre del niño), ¿le dio líquidos, además de la leche materna.... (lea las opciones a la madre)
- a. más de lo que normalmente le da --
 b. igual a lo que normalmente le da --
 c. menos de lo que normalmente le da --
 d. dejó de darle completamente --
 e. pecho exclusivamente --
17. Durante la diarrea de (nombre del niño), ¿le dio alimentos blandos, atoles o purés.... (lea las opciones a la madre)
- a. más de lo que normalmente le da --
 b. igual a lo que normalmente le da --
 c. menos de lo que normalmente le da --
 d. dejó de darle completamente --
 e. pecho exclusivamente --
18. Cuando (nombre del niño) tuvo diarrea, ¿qué tratamiento le dio? (puede marcar más de una respuesta)
- a. nada --
 b. sobres de rehidratación oral --
 c. solución de agua y sal (suero casero) --
 d. líquidos, tés o cocimientos caseros --
 e. medicinas antidiarréicas o antibióticos --
 f. otro (especifique) _____ --
19. Cuando (nombre del niño) tuvo diarrea, ¿pidió consejo o ayuda?
- a. sí --
 b. no -- (pase a la 21)
20. ¿De quién recibió el consejo o ayuda para la diarrea de (nombre del niño)? (Si la madre contesta "doctor", averigüe dónde fue o a cuál doctor fue) (puede marcar más de una respuesta).
- a. hospital general --
 b. centro de salud/puesto de salud --
 c. médico/clínica particular --
 d. farmacia --
 e. trabajador voluntario de salud (URO) --
 f. curandero --
 g. partera --
 h. parientes y amigos --
 i. otro (especifique) _____ --
21. ¿Qué signos de gravedad harían que busque ayuda para la diarrea de (nombre del niño)?
- a. no sabe --
 b. vómitos --

- c. fiebre
- d. boca seca, ojos hundidos, mollera hundida, orina poco (deshidratación)
- e. diarrea prolongada (más de 14 días)
- f. sangre en las heces
- g. pérdida del apetito
- h. débil o cansado
- i. otros (especifique) _____

22. Si (nombre del niño) tuviera diarrea, ¿qué es lo más importante que usted debería hacer?

- a. no sabe
- b. iniciar líquidos rápidamente
- c. darle de tomar al niño más de lo que usted normalmente le da
- d. preparar y administrar las sales de rehidratación oral
- e. darle al niño comidas pequeñas más frecuentes
- f. llevar al niño a un hospital general o centro de salud
- g. darle al niño más comida que normal cuando el niño mejorando de la diarrea para reponer el crecimiento perdido
- h. otro (especifique) _____

23. ¿Qué debe hacer una madre cuando su niño está recuperándose de una diarrea? (puede marcar más de una respuesta)

- a. no sabe
- b. dar alimentos con más frecuencia y en menor cantidad
- c. más alimentos de lo que normalmente le da
- d. alimentos con alto contenido calórico
- e. dar menor cantidad de alimentos
- e. otros (especifique) _____

Infecciones Respiratorias Agudas

24. ¿Ha estado (nombre del niño) enfermo con tos o dificultad para respirar en las últimas dos semanas?

- a. sí
- b. no (pase a la 28)

25. ¿Tenía (nombre del niño) dificultad en respirar, o respiraba como cansado (disnea), cuando estuvo enfermo?

- a. sí
- b. no (pase a la 28)
- c. no sabe (pase a la 28)

26. ¿Ha pedido Ud. consejo o ayuda para (nombre del niño) cuando ha estado enfermo con tos y dificultad para respirar?

- a. sí
- b. no (pase a la 28)

27. ¿De quién recibió consejo o ayuda para (nombre del niño), cuando estuvo con tos y dificultad para respirar? (puede marcar más de una respuesta; si la madre contesta "doctor" averigüe

- dónde fue o a cuál doctor fue)
- a. hospital general
 - b. centro de salud/puesto de salud
 - c. médico/clínica particular
 - d. farmacia
 - e. trabajador voluntario de salud
 - f. curandero
 - g. partera
 - h. parientes y amigos
 - i. otro (especifique) _____

28. ¿Cuáles son las señales y síntomas de infección respiratoria que la haría llevar a (nombre del niño) a un centro de salud? (puede marcar más de una respuesta)
- a. no sabe
 - b. respiración rápida y agitada
 - c. retracciones intercostales
 - c. pérdida del apetito
 - d. fiebre
 - e. tos
 - f. otro (especifique) _____

Control de Malaria

29. ¿Qué está haciendo Ud. para que no le de malaria o paludismo? (Puede marcar más de una respuesta).
- a. nada
 - b. mosquiteros
 - c. Plagatox u otro repelente
 - d. desaguar charcos o pantanos u otras colecciones de agua
 - e. tomando pastillas profilácticas
 - f. otro (especifique) _____

30. ¿Qué señales o síntomas de malaria o paludismo le harían acudir a un centro de salud? (puede marcar más de una respuesta)
- a. no sabe
 - b. fiebre
 - c. escalofríos
 - d. dolor de cabeza
 - e. confusión mental
 - f. vómitos
 - g. palidez
 - h. decaimiento
 - i. no considera necesario ir al centro
 - j. otro (especifique) _____

Control de Crecimiento

31. ¿Tiene (nombre del niño) su tarjeta de control de peso?
- a. sí
 - b. no, perdió la tarjeta (pase a la 33)
 - c. no, nunca tuvo tarjeta (pase a la 33)

32. Mire la tarjeta del niño y registre la siguiente información: ¿ha sido pesado el niño en los últimos 3 meses?

- a. sí —
- b. no —

Inmunizaciones

33. ¿Ha recibido alguna vacuna (nombre del niño)
- a. sí —
 - b. no —
 - c. no sabe —
34. A qué edad (nombre del niño) debería recibir la vacuna. contra el sarampión?
- a. especifique en meses —
 - b. no sabe —
35. ¿Tiene Ud. la tarjeta de vacunación de (nombre del niño)
- a. sí — (pida que se lo muestre)
 - b. no, perdió la tarjeta — (pase a la 37)
 - c. no, nunca tuvo uno — (pase a la 37)

36. Mire la tarjeta de vacunación y registre las fechas de las inmunizaciones en el espacio correspondiente:

Dia/Mes/Año

BCG _____:

Antipolio

- 1a. _____
- 2a. _____
- 3a. _____
- 4a. _____
- 5a. _____

DPT

- 1a. _____
- 2a. _____
- 3a. _____

Antisarampión _____

37. ¿Puede decirme la razón principal porque una mujer embarazada necesita ser vacunada con toxoide tetánico?
- a. para proteger madre y niño contra el tétanico —
 - b. para proteger sólo a la mujer contra el tétano —
 - c. para proteger sólo al niño contra el tétano —
 - d. otro o no sabe —

38. ¿Cuántas vacunas contra el tétano debe recibir una mujer embarazada, para proteger al recién nacido?
- a. una —
 - b. dos —
 - c. más de dos —
 - d. ninguna —
 - e. no sabe —

Salud Materna

39. ¿Tiene usted una tarjeta de control prenatal?
- a. sí —

25

- b. no, se le perdió - (pase a la 40)
 c. no, nunca tuvo uno - (pase a la 40)
40. Mire la tarjeta de control prenatal y anote el número de vacunas de TT en el espacio abajo:
 a. uno -
 b. dos o más -
 c. ninguno -
41. Mire la tarjeta y anote cuántas visitas de control prenatal ha hecho.
 a. uno -
 b. dos -
 c. ninguno -
42. ¿Está Ud. embarazada ahora?
 a. sí - (pase a la 46)
 b. no -
 c. no sabe -
43. ¿Quisiera Ud. tener otro hijo en los próximos dos años?
 a. sí - (pase a la 46)
 b. no -
 c. no sabe -
44. ¿Está Ud. usando algún método para no salir embarazada ahora?
 a. sí -
 b. no - (pase a la 46)
45. ¿Cuál es el método que Ud. o su esposo, están usando ahora para que no salga embarazada?
 (puede marcar más de una respuesta)
 a. operación de la mujer -
 b. operación del hombre -
 c. inyecciones -
 d. pastillas anticonceptivas -
 e. dispositivo intra-uterino -
 (DIU, espiral, T de cobre, ASA) -
 f. diafragma -
 g. condones -
 h. espumas o gel -
 i. lactancia materna exclusiva -
 j. método del ritmo -
 k. abstinencia -
 l. coito interrumpido -
 m. otros -
46. Cuando Ud. estaba embarazada de (nombre del niño), ¿visitó algún centro de salud (clínica u hospital) o una partera para su control del embarazo?
 a. sí -
 b. no -
47. ¿A los cuántos meses de embarazo, debe ir una mujer a un centro o puesto de salud o a una partera?
 a. no sabe -

- b. al primer trimestre, 1-3 meses -
 - b. a la mitad del embarazo, 4-6 meses -
 - c. al último trimestre, 7-9 meses -
 - d. a la hora del parto -
 - e. no necesita ir -
 - f. otro (especifique) _____ -
48. ¿Qué alimentos debería comer una mujer, para evitar la anemia durante el embarazo? (puede marcar más de una respuesta)
- a. no sabe -
 - b. vegetales ricos en hierro como la hoja de remolacha, de yuca o de rábano -
 - c. carne, pescado, huevos -
 - d. otro (especifique) _____ -
49. ¿Durante el embarazo de (nombre del niño), la cantidad de alimentos que Ud. comió fueron..... (lea las opciones a la madre)
- a. más de lo que normalmente come? -
 - b. igual a lo que normalmente come? -
 - c. menos de lo que normalmente come? -
 - d. no sabe -
50. ¿Cuándo nació (nombre del niño), quién ató y cortó el ombligo?
- a. ella misma -
 - b. un miembro de la familia -
 - c. partera/matrona -
 - d. personal de salud (médico o enfermera) -
 - e. no sabe -
 - f. otro (especifique) _____ -

APPENDIX C

REPUBLICA DE NICARAGUA
Child Survival Project
Cluster Identification Form

Region	Municipality	Communities	Pop.	Familias	Cumulative Pop.	Selection List
Río San Juan	Los Chiles	Los Chiles	1,305		1,305	
		El Fajardo	534		1,839	①
		San Ramón	249		2,088	
		Santa Elena	155		2,243	
		El Espejo	208		2,451	
		Nueva Armenia #1	251		2,702	
		Nueva Armenia #2	267		2,969	②
		La Bodega	530		3,499	
		El Ventura	173		3,672	
		Las Maravillas	84		3,756	
		Las Minas	213		3,969	
		Buena Vista, La Palmera,	364		4,333	③
		La Trinidad	454		4,787	
		San Agustín	207		4,994	
			Subtotal		4,994	
	San Miguelito	San Miguel	4,829	650	5,479	
		Nueva Oporta	560	101	6,039	
		El Ocho	120	24	6,159	④
		El Peñon	106	22	6,265	
		Potreros	488	59	6,753	
		Emp. Los Sánchez	219	44	6,972	
		Pantanos	299	52	7,271	⑤
		Ariadna Garcia	126	25	7,397	
		Mancha de Coyal	123	25	7,520	
		Tambora	194	39	7,714	
		La Conquista	284	57	7,998	
		Nigdonio Perez	429	71	8,427	
		Isabel Perez	428	75	8,900	⑥
	Subtotal		8,205			
	Sábalo	Buena Vista	900	180	990	
		Guásimo	315	62	1,035	⑦
		Giordiano	100	20	1,035	
		Choncho	75	15	1,040	
		Las Minas	50	10	1,040	
		El Bosque	100	20	1,050	
		Quezada	250	50	1,080	
		Marcelo	300	60	1,110	
		Marlon Zelaya	225	45	1,135	
		Mauricio Gutierrez	125	25	1,160	
		Laguna Blanca	75	15	1,155	
		Las Colinas	300	60	1,185	⑧
		Las Maravillas	400	80	1,225	
Hule y Cachito Che Guevara	350 225	70 45	1,285 1,280			

Region	Municipality	Communities	Pop.	Families	Cumulative Pop.	Selection List
		Romero	100	20	12910	
		El Quesillo	500	100	13410	(9)
		La Pintada	75	15	13485	
		Gavilan	60	12	13545	
		Bartola	75	15	13620	
		Palma Africana	80	16	13700	
		Laureano Mairana	441	85	14141	
		Sabalos	475	95	14616	
		San Antonio Lanioca	136	25	14752	(10)
	Subtotal		5,732			
	El Castillo	El Castillo	690	138	15442	
		Palma Africana	215	43	15657	
		Che Guevara	318	64	15975	(11)
		Las Colinas	583	117	16558	
		Marlon Zelaya	273	55	16831	(12)
		Breva Vista	1,150	230	17981	
		Boca de Sabalos	231	47	18212	
		Laureano Mairana	385	77	18597	
		Corexa	218	44	18815	
		Monico	225	45	18940	(13)
		La Gloria	348	70	19288	
		Guasimo	372	75	19660	
		Gordiano	120	24	19780	
		El Bosque	120	24	19900	
		La Quezada	360	72	20260	
		Mauricio Gutierrez	150	30	20410	
		Laguna Blanca	150	30	20560	(14)
		Hule Cachito	400	80	20960	
		La Pintada	90	18	21050	
		La Juana	90	18	21140	
		S/Antonio - La Noca	150	30	21290	
		Marcelo	265	53	21555	
	Subtotal		6,903			
	San Carlos	San Carlos	9,200		20,755	(15)(16)(17)(18)(19)(20)
		Sta. Isabel	615		21,370	(21)
		Laurel Galan	1,120		22,490	(22)
		Nva. Jerusalem	375		22,865	
		Cruz Verde	683		23,548	(23)
		Empalme de Cruz Verde	340		23,888	
		La Culebra	292		24,180	(24)
		Argentina	230		24,410	
		El General	220		24,630	(25)
		Mexico	1,002		25,632	
		Mata de Caña	380		26,012	(26)
		Cano Luis	352		26,364	
		Melchorita	820		27,184	(27)
		Esperanza #1	958		28,142	(28)
		Morillo	580		28,722	(29)

Region	Municipality	Communities	Pop.	Familias	Cumulative Pop.	Selection List
		Solentiname	1,200		40042	(27)
		Papaturro	432		40474	
		Rivera del Rio	80		40554	
		San Juan del Norte	206		40760	
		Subtotal	19,105			
	La Azucena	La Azucena	870		41635	(28)
		Ast. J. Haz	338		41973	
		Coop. 19 Julio	134		42107	
		San Jose	112		42219	
		El Papayo	58		42277	
		Monte Piedad	58		42335	
		San Isidro	105		42440	
		Palo de Arquito	467		42907	
		La Venada	442		43349	(29)
		Ast. La Venada	303		43652	
		San Jose	187		43839	
		La Union	191		44030	
		Melchora	132		44162	
		El Consuelo	93		44255	
		Pavon #1	203		44458	
		Pavon #2	205		44663	(30)
		Subtotal	3,903		44663	Sampling Interval =
Nueva Guinea	Nueva Guinea		15,630		44663	
	Los Angeles		5,766			
	San Miguel		1,050			
	El Verdún		5,790			
	Blanca Sandino		1,398			
	Jose B. Escobar		5,190			
	Nuevo Leon		978			
	El Serrano		1,830			
	La Fonseca		7,338			
	Los Pintos		480			
	San Antonio		2,064			
	San Pablo		624			
	Jacinio Baca		1,560			
	Los Laureles		2,480			
	Tololinga		4,410			
	Providencia		3,240			
	Kuinwás		1,740			
	San Jose		2,490			
	San Juan		1,206			
	Camcito		1,002			
	El Nispero		960			
	Gerusalen		1,820			
	San Martin		1,440			
	Jolaina		1,320			
	La Esperanza		1,880			
	Ruben Dario		1,530			

$$\frac{44663}{30} = 1489$$