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HEALTHCOM EVALUATION
FIELD NOTE

Guatemala Baseline Survey: Basic Tables and Implications for Strategy

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SUMMARY AND PROGRAM RECOMMENDATIONS: GUATEMALA BASELINE SURVEY

1. Radio has, by far, the largest reach of any communication channel in Guatemala; it reaches three-fifths of the population on a daily basis. Television is much less common (20 percent of the population watch daily) and as will be noted below, is restricted to people of higher socioeconomic status. Radio is the channel appropriate for reaching the target audience.

2. The largest number of radio listeners (84 percent) prefer and almost all (97 percent) do listen to Spanish-language radio. From a technical point of view, broadcasts in Spanish only can be justified.

3. More than half of the radio owners report listening at different times of the day between 6 a.m. and 6 p.m. No preference for broadcast times within these hours can be stated.

4. People mention listening to many different radio stations at many times of day and to many different types of radio programs. Radio broadcasts need to be frequent and distributed over a range of radio stations with some emphasis on blocks around news and popular music programs.

5. At the time of the survey, one-third of the population at most had visited a clinic in the previous month, and only 50 percent had visited in the previous six months, although 90 percent of the sample communities were within an hour of a clinic. Some of the rest did visit private physicians, but it was clear that a large proportion of the population was not in contact with clinic personnel, and that for many who did visit the clinic, contact was infrequent. Because diarrheal episodes were frequent, one must assume that cases were not often referred to the clinic. If audiences are to receive pro-ORT messages directly, contact with clinic staff can only be one channel. Contrarily, the pace of change in consumer practice expected from a program addressing clinic staff only is likely to be slow. Nonetheless, clinics are used by a substantial portion of the poorest groups, and, as will be noted below, are the major source of ORS. Thus, some continued emphasis on clinic training is appropriate.

6. Local Health volunteers are not active in the great majority of communities. Unless there is a major push to recruit and maintain new volunteers, and it can be shown that

they are in place with appropriate skills over time, they will not be a viable channel. In the early stages of a communication intervention, at least, no reliance should be placed on the volunteer channel of communication intervention.

7. Midwives are more active in communities than volunteers, but contact with them is infrequent; only one-quarter of the respondents had seen a midwife in the past year, presumably in association with a pregnancy. Midwives are not a currently operational channel for general health advice. In the future, after additional training and the development of appropriate incentives for them, midwives may be a helpful channel because they are present in most communities. At this time, however, the program should not rely on midwives.

8. ORS was moderately well known (about one-half of the respondents recognized the packet), but it was rarely used in Guatemala -- about nine percent of all last cases were said to have been treated with ORS. When mothers did seek outside help for their children (about evenly divided among the government medical system, pharmacies or stores, and private physicians) they reported that they were rarely told to use ORS. Even among users of the government medical system, only 29 percent of the last cases were given ORS. Private physicians were said to prescribe ORS 16 percent of the time and pharmacies only four percent. A major effort is called for to legitimize ORS among health professionals and to encourage pharmacies to market it.

9. No symptom of diarrhea strongly predicts the pattern of help seeking, including whether any treatment is employed or whether outside help is sought. No message which tries to key recommended treatments to the presence of a particular symptom can be recommended.

10. There is some association between perceived seriousness of a case and probability of treatment and outside help seeking. However that association does not suggest unequivocally any particular message strategy because we do not have evidence that cases which are actually serious are the same ones which are perceived as serious in a timely fashion by mothers. Indeed, given lack of association of symptoms with treatments, any attempt to restrict ORS use to a moderate stage of a diarrheal episode (assigning home fluids to beginning diarrhea and clinic visits to serious cases) risks frequent incorrect treatment.

11. A reasonably high coverage rate for DPT, polio and measles (75-85 percent of children by their second birthday) was present among the children surveyed in February, 1987. However, the achievement of that coverage level was delayed well beyond the World Health Organization's recommended time for coverage. DPT3 coverage, for example, was only 35 percent of those who were 12 months old at the time of the survey, even though it reached 75 percent of those 24 months old. Moreover, positive current coverage may have been substantially a residual effect from the 1986 jornadas (intensive vaccination days). The sharp difference between current 12 month old coverage and current 24 month old coverage did not reflect only the effects of age. It reflected the particular vaccination programs that benefited the older children and which did not benefit the younger ones. A continuation of current no-jornada policy will produce a substantial lowering of overall coverage rates.

12. Both the age pattern and the time pattern of coverage indicate that routine services are not doing the job in Guatemala. Whatever success was seen at the time of the survey reflected the special efforts undertaken through the jornadas. However the jornadas, while they do sharply boost coverage, do not create a baseline coverage level which can be maintained through the operation of the routine system. The jornadas produce an effect, but when they are stopped, their effects disappear soon thereafter. If Guatemala is to increase timely vaccination coverage it will need to develop an approach which is somewhere in between routine service and jornadas. It may be that a combination of routine service with regular (perhaps bimonthly) heavy jornada-like mass media promotion will encourage participation in regular vaccinations while not overloading the health system.

BACKGROUND AND DESCRIPTION

In February and March, 1987, the Guatemalan Ministry of Health (MOH) undertook a national survey of caretakers of children under five years old to be used in planning a health education program to affect practices related to child diarrheal disease and immunization. The survey was carried out by the Nutritional Institute of Central America and Panama (INCAP) under the Ministry's supervision. The Annenberg School of Communications at the University of Pennsylvania provided technical assistance to INCAP and the MOH under the Communication for Child Survival project (HEALTHCOM). Funding for the study came from USAID/Guatemala, which provided additional technical assistance through the Technologies for Primary Health Care (PRITECH) program.

The survey will also be used as a baseline measure to evaluate the program. After the post-program survey is completed (now scheduled in early 1990), a more detailed analysis of both pre- and post- measures will be undertaken. This field note presents some salient findings from the original survey which may bear directly on educational strategies. This is not a complete report of the survey results; rather, basic tables and explanatory text to support program decision making are presented.

This field note is divided into four sections: the first discusses what channels of communication reach the target audience; the second describes current knowledge about and use of Oral Rehydration Solution (ORS); the third describes vaccination coverage of children and some effects of previous vaccination programs; and the final section examines the relationship between background characteristics of individuals and their use of particular channels of communication.

SAMPLE

The sample for the diarrheal disease and immunization survey included 9,187 mothers or caretakers of children under five years old. They were randomly selected within clusters in all twenty-two departments (states). The sampling design assured a reasonably representative sample of each department. The results reported here would have to be weighted again in order to represent the complete Guatemalan population, but they will serve as a guide in their present form.

A preliminary picture of the sample may be gained from a description of a few salient characteristics of the respondents. Almost all (92 percent) of the interviewees were mothers, although alternative primary caretakers were also interviewed. Three quarters of the sample said they customarily spoke Spanish at home, rather than any indigenous language. Of the remaining one-quarter, 54 percent said they were able to speak Spanish as well as the indigenous language they spoke at home. Thus more than 85 percent of the respondents considered themselves Spanish-speakers. Almost half of the mothers had no formal education, and about one-third of the persons described as head-of-household by the respondent had no formal education.

CHANNELS OF COMMUNICATION

This section begins with a discussion of mass media channels and then turns to a discussion of interpersonal channels.

Mass Media

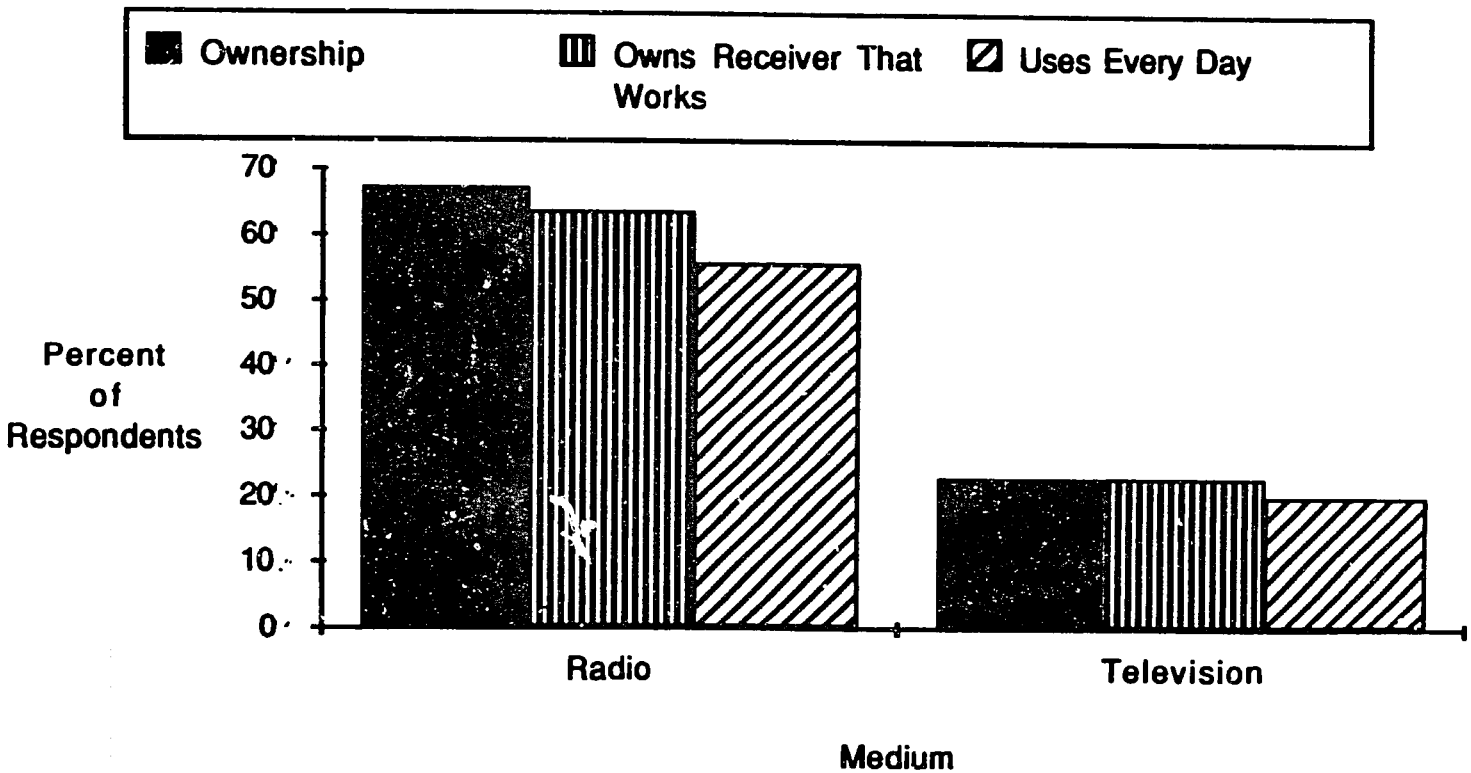
Radio has, by far, the largest reach of any channel of communication and is the primary channel appropriate for reaching the target audience.

Figure 1 presents data about the ownership and use of radios and televisions by mothers in the sample. About 66 percent owned radios, 63 percent had radios that worked, and 56 percent listened to the radio every day. In contrast, 23 percent had a television that worked, and 20 percent watched television every day.

Radio broadcasts need to be frequent and distributed over a range of radio stations with some emphasis on blocks around news and popular music programs.

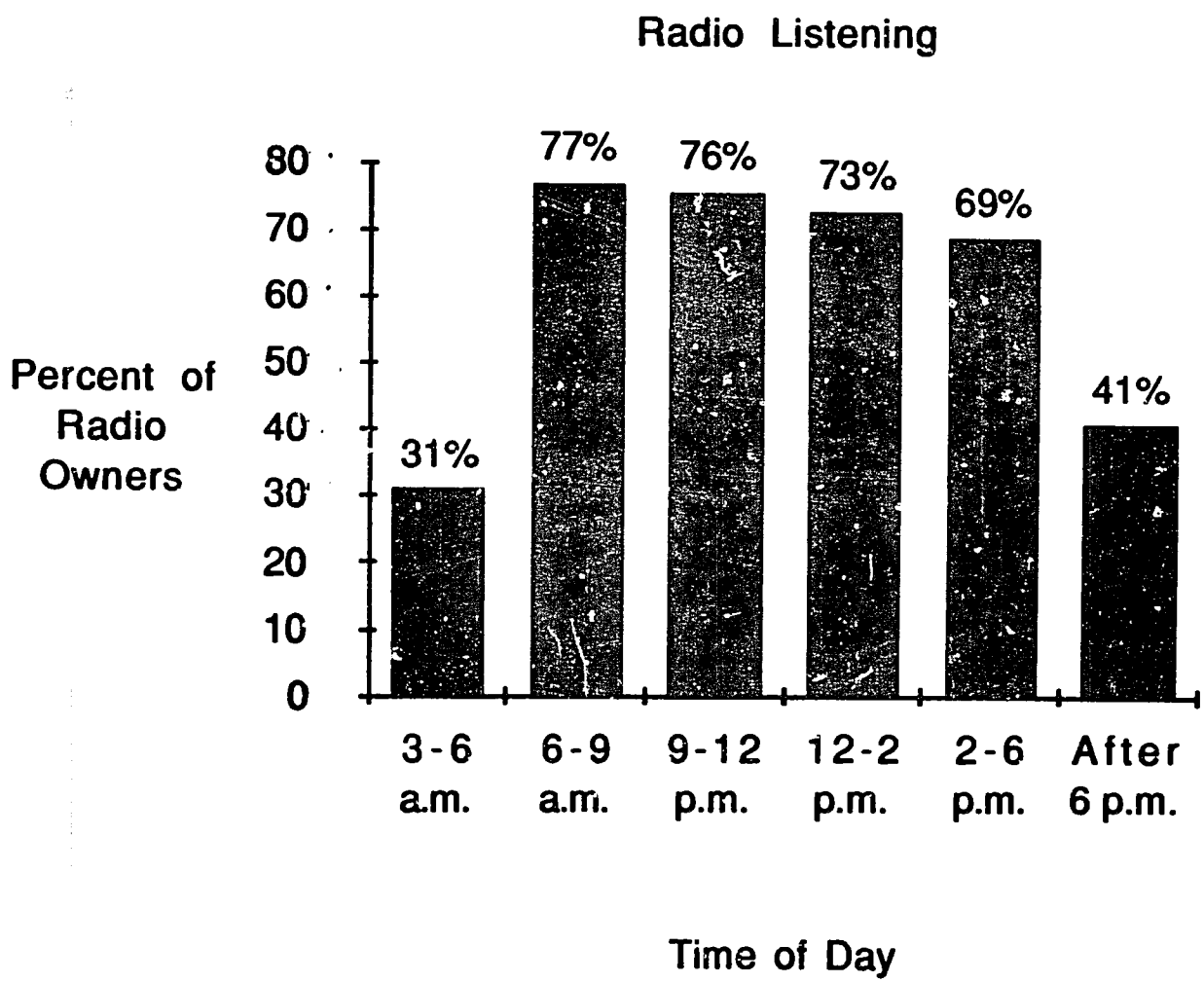
People mentioned listening to many different radio stations at many times of the day and to many different types of radio programs. Respondents said that they listened to the radio most often before noon although they reported listening at all times between 6 a.m. and 6 p.m. (Figure 2). The favorite radio programs were popular music and news programs. Television was most often watched in the evening, although afternoon watching also was widespread (Figure 3). Therefore, no preference for broadcast times within these hours can be stated.

Figure 1



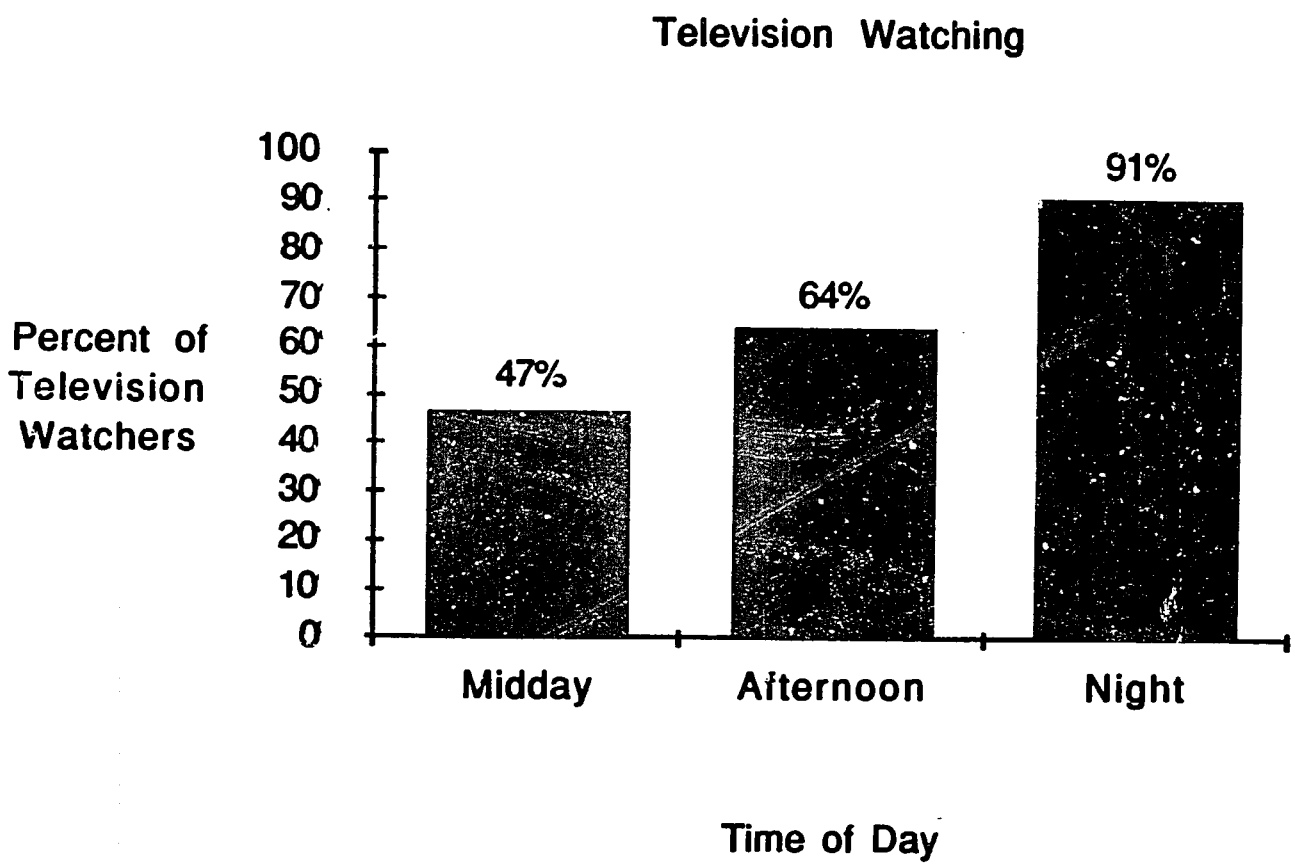
Ownership and Use of Mass Media

FIGURE 2



Radio Listening by Time of Day

FIGURE 3



Television Watching by Time of Day

The largest number of radio listeners prefer, and almost all do, listen to Spanish language radio. From a technical point of view, broadcasts in Spanish only can be justified.

Ninety-six percent of the radio listeners reported listening in Spanish, but only 84 percent said they preferred to listen in Spanish, while 7 percent of the listeners preferred to listen in Quiche, and the rest in other indigenous languages. Those who spoke Spanish or Quiche at home were more likely to own radios than those who spoke other languages. Sixty-nine percent of the Spanish speakers owned radios, compared to 64 percent of those who spoke Quiche, 57 percent Kekchi, 52 percent Kakchiquel, and 49 percent Mam.

Spanish speakers were much more likely to watch television than the other groups. Thirty-three percent of the Spanish speakers watched television, compared to four percent of the Quiche speakers, five percent of the Kakchiquel speakers, one percent of the Kekchi speakers, and two percent of the Mam speakers. Because language group is associated with wealth and wealth is associated with television ownership, we assume this language difference largely reflects a difference in socioeconomic status. Nonetheless, it suggests the difficulty of reaching non-Spanish speakers through television.

Clinics

If audiences are to receive pro-ORT messages directly, contact with clinic staff can be only one channel. The pace of change in consumer practice expected from a program addressing clinic staff only is likely to be slow. Nonetheless, clinics are used by a substantial portion of the poorest groups and are the major source of ORS. Thus, some continued emphasis on clinic training is appropriate.

At most, one-third of the population visited a clinic in the previous month, and only 50 percent visited in the previous six months, although 90 percent of the sample communities were within an hour of a clinic. Some of the rest of the population visited private physicians. It was clear that a large proportion of the population was not in contact with clinic personnel, and that for many who did visit the clinic, contact was infrequent. Because diarrheal episodes are frequent, one must assume that cases are not often referred to the clinic.

About 32 percent reportedly had never visited a health center with their children younger than five years old. Twenty-four percent visited within one month of the interview, 26 percent one to six months prior to the interview, ten percent six to twelve months prior to the interview, and the last eight percent had visited over a year ago (Figure 4).

People who lived closer to the health center were more likely to have visited it recently than those who lived farther away. On the average, in about 11 percent of the communities, residents said that they had a health center that was more than an hour away. In those communities, only 23 percent of the people claimed to have taken a child to the health center in the last month. In contrast, in the rest of the communities whose residents said they lived less than an hour away from a clinic, about 36 percent claimed to have taken a child in the last month (Figure 5).

Local Volunteers

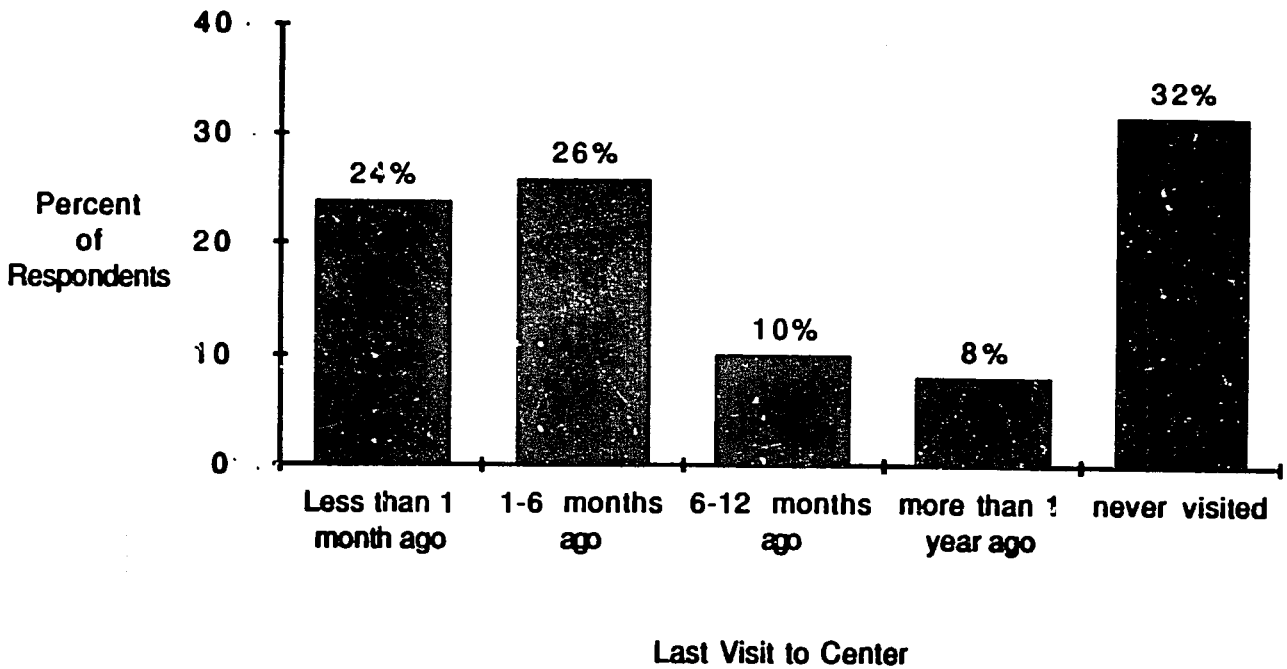
In the early stages of the communication campaign, no reliance should be placed on volunteer health workers as a channel.

Local health volunteers are not active in the great majority of communities. Unless there is a major push to recruit and maintain new volunteers, and it can be shown that they will be located at appropriate locations and will have the appropriate skills over time, they will not be a viable channel.

Figure 6 shows that most people have not had any contact with volunteers. Sixty-one percent of the respondents said that there were no volunteers in their communities, while 30 percent did not know if there was a volunteer. Only the remaining nine percent claimed to have had any contact with such a volunteer. Two percent of these respondents claimed to have contacted a volunteer over a year ago, and the remaining seven percent had contacted one at some point in the past year.

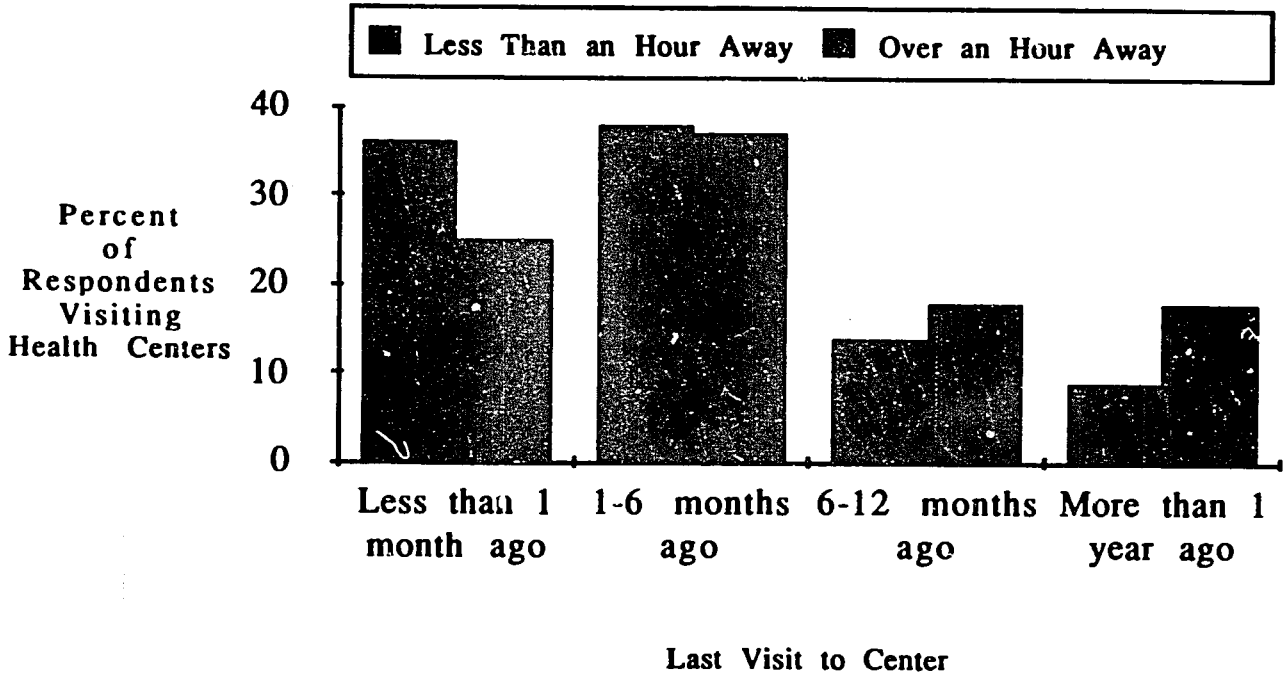
Almost all (98 percent) of the few volunteers who were mentioned lived in the same community as the respondent. Most often, these volunteers were reported to have given vaccinations (48 percent of the volunteers) and/or health advice (29 percent of the volunteers). This health advice was reported to be about diarrhea in 88 percent of such contacts mentioned.

FIGURE 4



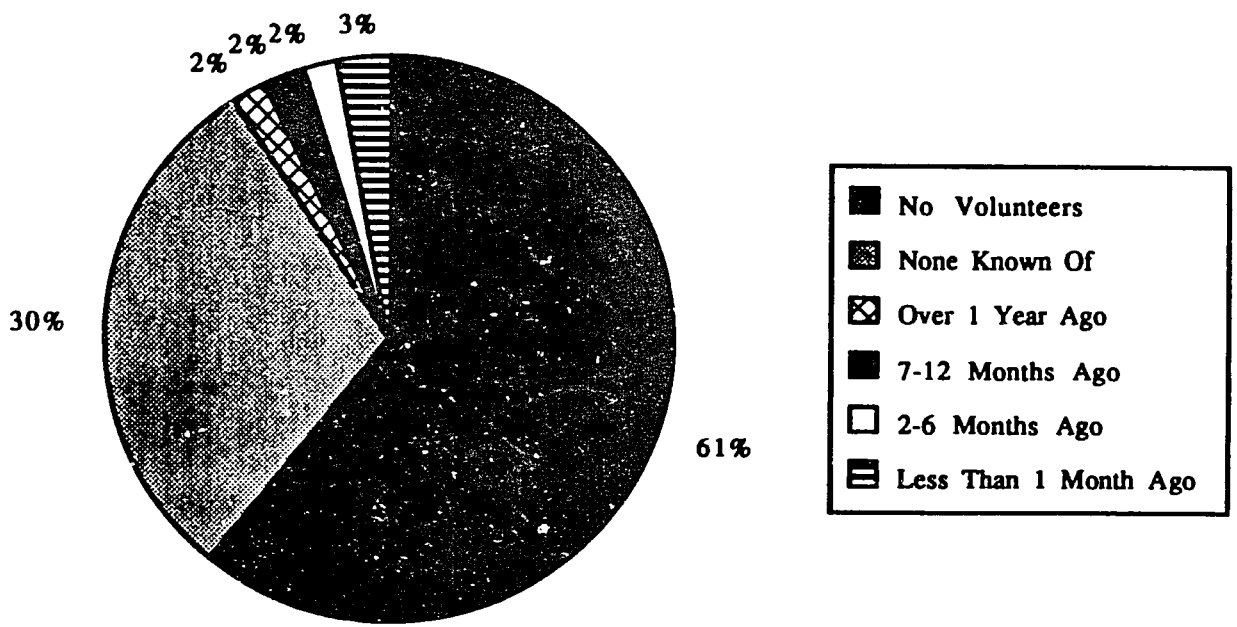
Use of Health Centers

FIGURE 5



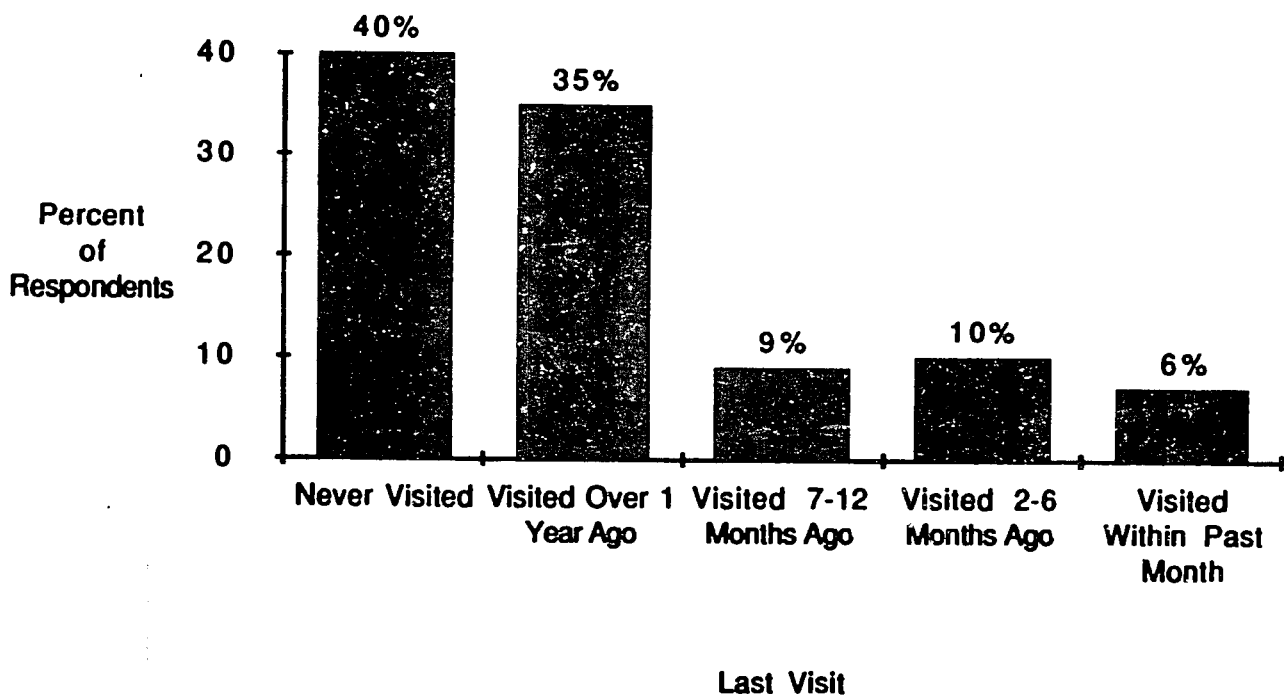
Visits to Health Center by Distance

FIGURE 6



Volunteer Visits

FIGURE 7



Midwife Visits

Midwives

At this time the program should not rely on midwives.

Within most communities, midwives are more active than volunteers, but contact with them is infrequent. Midwives are currently not an operational channel for general health advice. Most of the midwives (97 percent) lived in the same village as the respondent, however almost all of the contact with midwives was likely to have been related to pregnancy rather than children's health. In the future, after additional training and the development of appropriate incentives for them, midwives may be a helpful channel because they are present in most communities.

Figure 7 illustrates respondents' contact with midwives. Forty percent said they did not visit midwives, and 35 percent said they visited one over a year ago, leaving 25 percent who had seen a midwife within the past year.

ORS: Knowledge And Treatment Of Diarrhea

A major effort is called for to legitimize ORS among health professionals and to encourage pharmacies to market it.

Overall, use of and knowledge about ORS was low, as was expected in the pre-campaign survey. ORS was moderately well known (about one-half of the respondents recognized the packet), but it was rarely used in Guatemala -- about nine percent of all last cases were said to have been treated with ORS. About one-half of the caretakers recognized ORS packets, and one-quarter of the respondents had heard of a home-made solution to be given to a child with diarrhea. Six percent were able to show an ORS packet in their home.

Of the women who spoke Spanish at home, ten percent reported using ORS, compared to seven percent of those who spoke Mam or Quiche, five percent of those who spoke Kakchiquel, and two percent who spoke Kekchi. It appears then that those who spoke Spanish at home were more likely to use ORS than those who spoke another language at home.

When mothers did seek outside help for their children (about evenly distributed among the governmental medical system, pharmacies or stores, and private physicians) they reported that they were rarely told to use ORS. The majority of the health community reportedly did not

prescribe ORS. Doctors, pharmacists, and health centers reportedly gave pills or syrups, rarely ORS, to children with diarrhea. Table 1 shows the treatments for diarrhea reportedly given by mothers' first sources of help. Only four percent of the pharmacies reportedly gave ORS, compared to 16 percent of the doctors, 29 percent of those working in the medical system, and 24 percent of the health volunteers. From 35 to 93 percent in these groups gave syrups, and 19 to 65 percent gave pills. Also, most mothers reported that doctors and the medical system were their first source of help, while few sought health volunteers for help with children's diarrhea.

Table 1

Treatment for Diarrhea Given by Mothers' First Source for Help

	Pills	Syrup	ORS	N
Pharmacy and store	65%	47%	4%	651
Private Doctor	19%	93%	16%	788
Medical System	34%	65%	29%	866
Volunteer	51%	35%	24%	86

Help Seeking

No symptom of diarrhea strongly predicted the pattern of help seeking, including whether any treatment was employed or whether outside help was sought.

Mothers were most likely to seek help for children who were vomiting, had blood in their stool, or had a fever along with the diarrhea. Table 2 shows the help seeking behavior of mothers for each reported symptom of diarrhea.

Table 2

Help Sought for Symptoms of Diarrhea

Symptom:	Did Not Treat	Home Treated	Sought Help	
Frequent Stools	14	36	50	(3387)
Watery Stools	16	38	46	(3846)
Odorous Stools	14	39	47	(3417)
Many Stools	15	37	48	(3039)
Blood in Stool	11	32	57	(593)
Fever	12	32	56	(2450)
Thirsty	15	39	46	(3653)
Less Active	13	36	51	(3131)
Vomiting	11	30	59	(1384)
Restless	14	37	49	(3327)

There is some association between perceived seriousness of a case, probability of treatment, and outside help seeking. However, that association does not suggest unequivocally any particular message strategy because we do not have evidence that cases which are actually serious are the same ones which are perceived as serious in a timely fashion by mothers. Indeed, given lack of association of symptoms with treatments, any attempt to restrict ORS use to a moderate stage of a diarrheal episode (assigning home fluids to beginning diarrhea and clinic visits to serious cases) risks frequent incorrect treatment.

Perception of Diarrhea and Socioeconomic Status (SES)

Both perceived severity of diarrhea and the respondent's socioeconomic status affected the likelihood that treatment would be sought.

A measure reflecting wealth and education was created. For convenience, this limited measure will be referred to as a scale of socioeconomic status (SES). This scale was created from five questions: the level of education of the woman, level of education of the head of household, type of floor in the house, type of water in the household, and number of rooms used for sleeping. One point was given if the woman had seven or more years of education. One point was given if the head of household had seven or more years of education. One point was given if the household had piped water. One point was given if the household floor was made of wood, cement or brick. One point was given if the household had two or more sleeping rooms. The scale made up from these items appears to be reliable (standardized alpha=.69) and fits together well (Factor 1 Eigenvalue =2.25, 45 percent of the total variance).

Mothers of higher SES levels were more likely to seek treatment for a child with diarrhea than mothers with lower SES levels. Also, mothers with higher SES levels tended to view cases of diarrhea as serious more often than those of lower SES levels. Table 3 elaborates on the effects of SES and perception of illness upon whether or not treatment was sought.

Table 3

Treatment Sought by Perception of Diarrhea and SES

SES	Slightly Ill	Moderately Ill	Seriously Ill
0	31 percent	39 percent	72 percent
1	33 percent	45 percent	69 percent
2	29 percent	49 percent	58 percent
3	25 percent	50 percent	83 percent
4	33 percent	61 percent	88 percent
5	39 percent	57 percent	93 percent

Liter Measurement

The question of accuracy of liter measurement, or the size of the drinking glass, is important for two reasons: first, the concentration of the solution needs to be within correct limits and, second, policy makers must decide whether ORS is to be distributed in liter-size or glass-size packets.

Oral Rehydration Solution is made by mixing a packet of dry ingredients with either a glass or a liter of clean water, depending on the size of the packet. The correct ratio of packet contents to water is important: too concentrated a solution can be toxic, too weak a solution, while not dangerous, reduces the effectiveness of the mixture in rehydrating the child.

Three questions on the Guatemala survey dealt with knowledge of a liter and the capacity of a drinking glass. Respondents were asked if they knew what a liter was. If they said yes, the interviewer asked to see what they used to measure a liter, and then measured its capacity in

milliliter (ml). The interviewer also measured the capacity of the most-used drinking glass for all respondents.

Three-quarters of the respondents said they knew what a liter was and 39 percent of these showed the interviewer a container with a one-liter capacity while another 33 percent showed a measure with a capacity of 800-1200 ml. The reported measured capacity of drinking glasses varied greatly, from less than 100 ml. to more than one liter.

If we convert the distribution of amount of water in the containers people said were "liter" containers into the sodium content of solutions that would be made using that amount to mix the standard one liter World Health Organization (WHO) packet, about 60 percent of the resulting solutions would be within ten percent of the target value (90 mEq/liter), about five percent would be 30 percent above the target value, and only two percent would be more than 30 percent below the target value (Figure 8).

In comparison, if we postulate that packets are made to produce a "correct" solution when mixed with 250 ml. of water, and we know that the most commonly used glasses had volumes between 100 ml and 1000 ml, fewer than 25 percent of the solutions prepared with such a glass would be within ten percent of the target value. There would be a much smaller proportion of high sodium solutions than there would be using the declared "liter" amounts of water. There would also be a much larger proportion of solutions more than 30 percent below the target value (Figure 8).

A comparison of sodium concentration to ml of water actually used for various standard-size packets clearly shows that smaller-size packets require more accuracy in water measurement than do packets made to mix with larger amounts of water. Thus a 50 ml. error in water measurement makes a huge difference in the sodium content of a solution made with a smaller standard packet -- a difference of about 17 percent or more. A 50 ml. error in measuring a liter results in a sodium content difference of about five percent (Table 4).

FIGURE 8

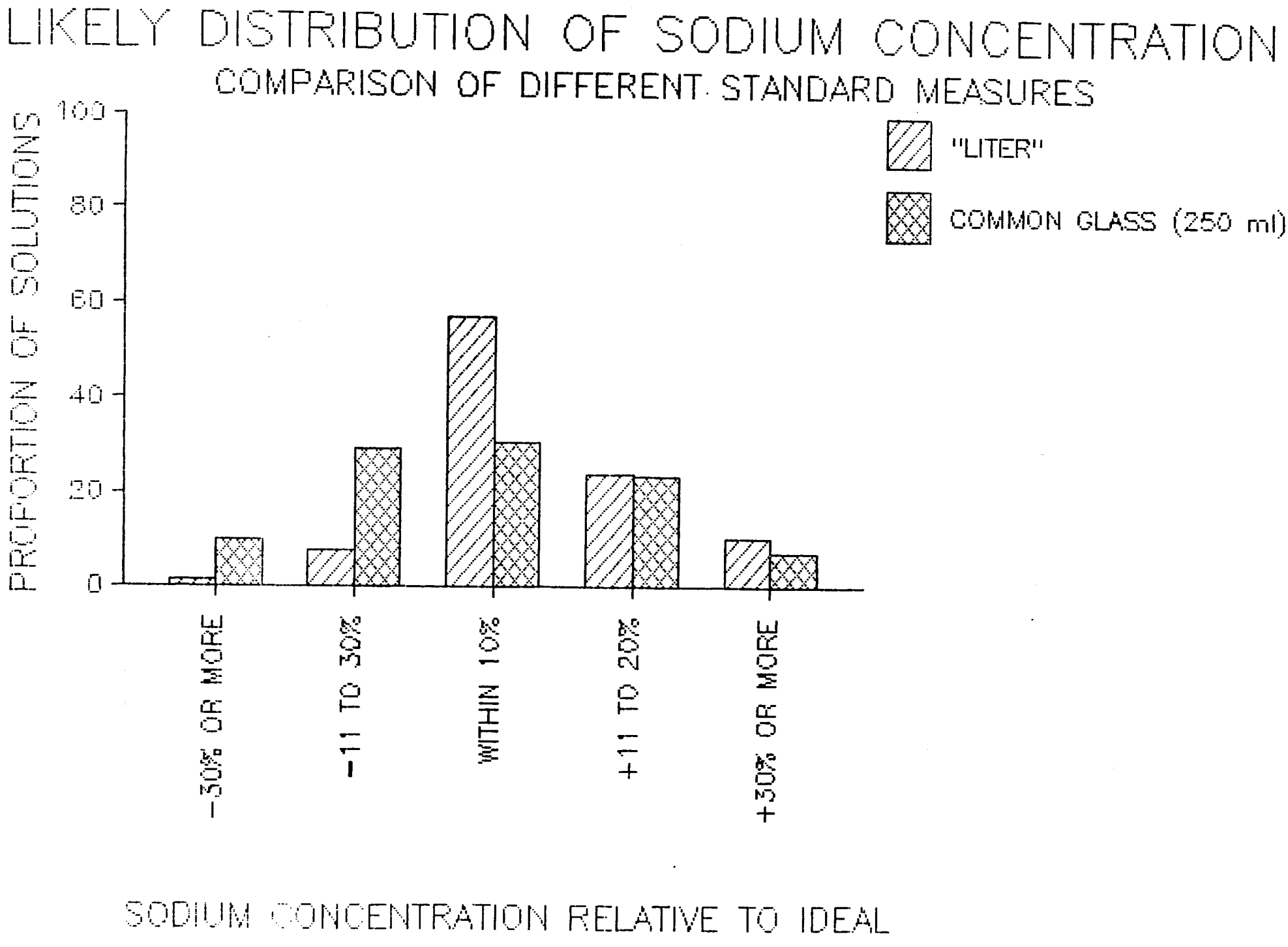

LIKELY DISTRIBUTION OF SODIUM CONCENTRATION
COMPARISON OF DIFFERENT STANDARD MEASURES
"LITER"
COMMON GLASS (250 ml)
PROPORTION OF SOLUTIONS
100
80
60
40
20
0
-30% OR MORE
-11 TO 30%
WITHIN 10%
+11 TO 20%
+30% OR MORE
SODIUM CONCENTRATION RELATIVE TO IDEAL

Table 4

Effective Error Rate of Amount of Water Used in Sodium Solution Concentrations

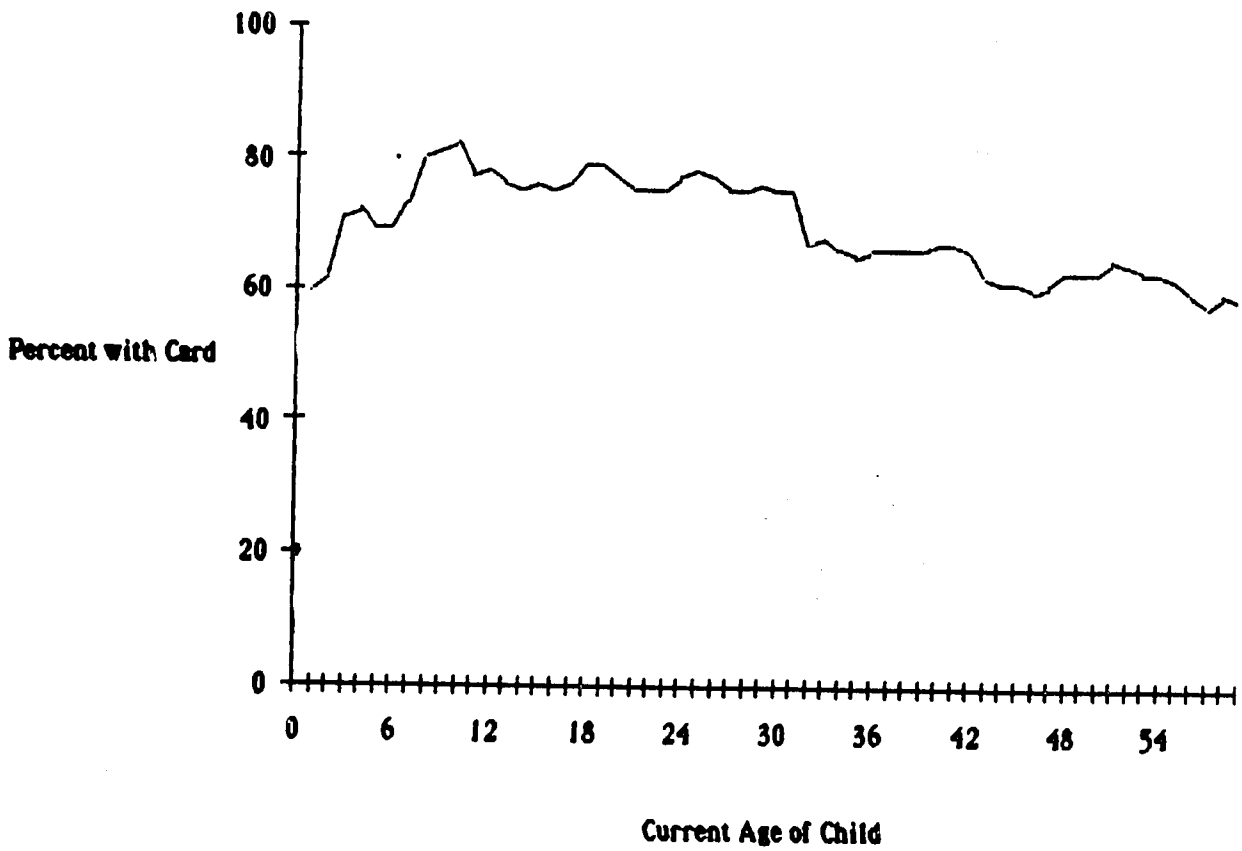
Water Used	Solution Sodium Concentration	Error
For a 250 ml packet		
correct amount: 250 ml	90	exact
50 ml too little	113	25% too high
50 ml too much	75	17% too low
For a 1000 ml packet		
correct amount: 1000 ml	90	exact
50 ml too little	95	5% too high
50 ml too much	85	5% too low

Neither "one liter" nor "one glass" is sufficient information for ORS mixing instructions. Between the two choices, however, a liter is probably more reliable because it is a standard measure which 60 percent of respondents were already able to identify correctly. This indicates that ORS could be distributed in one-liter packets, with information provided as to correct measurement of a liter. (This information should not take the form of "a liter is equivalent to four glasses.") Perhaps there is a commonly-sold product that comes in a liter bottle, e.g. Coca-Cola, that could be used to establish what is a liter.

VACCINATION

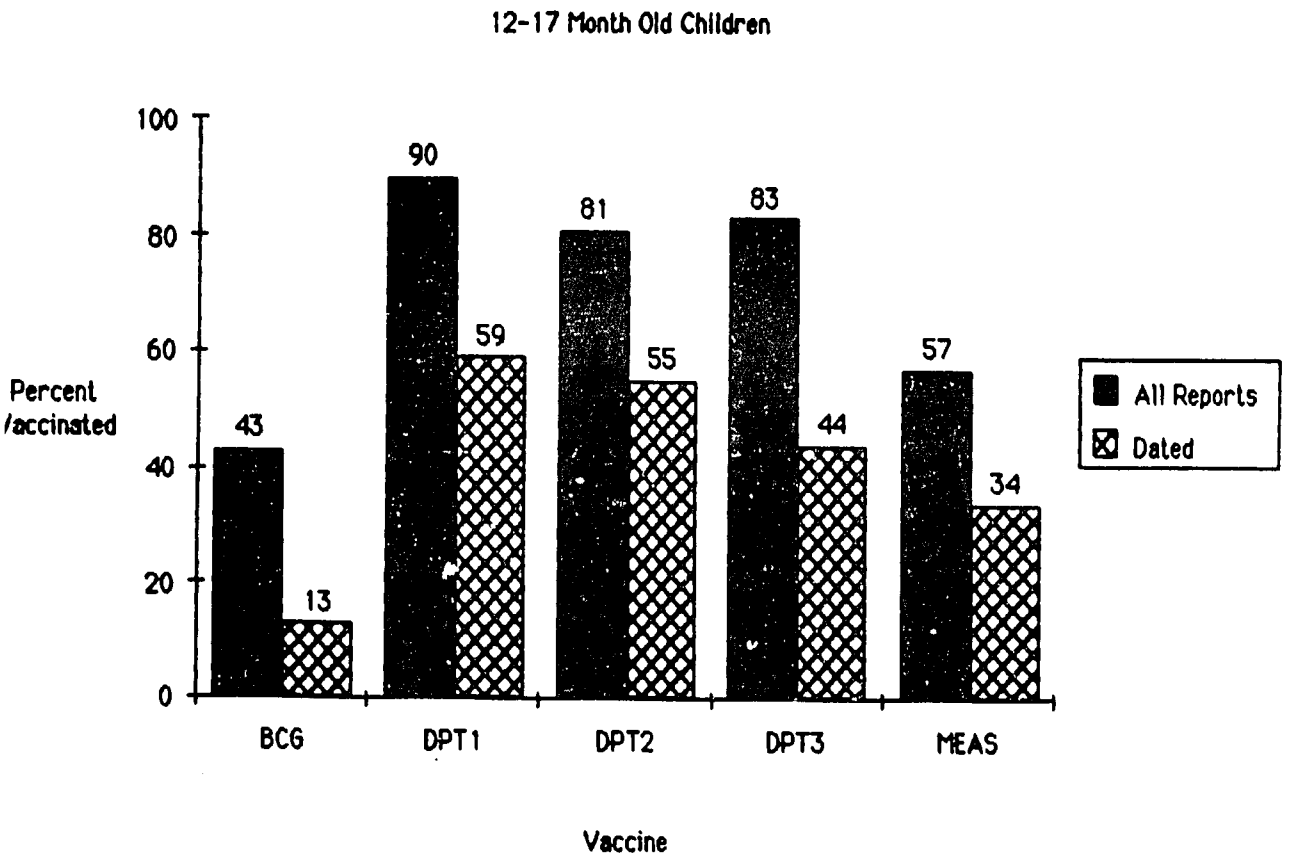
Questions about vaccination status were asked about 13,885 children under the age of five years old. Of these, 9,182 were the youngest children in their families; the rest were second or third youngest. For most of the analyses that follow we have used information about all these children, not just the youngest. Information about vaccination comes from two sources: the caretaker's report, and evidence from the child's vaccination card. The card information represents a conservative lower limit for estimates. For 17 percent of the sample, information was missing about whether or not a child had a card. Of the remainder, an average of 73 percent had cards, with this proportion varying little by current age (Figure 9).

FIGURE 9



Vaccination Card Ownership

FIGURE 10



Vaccine Coverage

Coverage

By the age of one year children should have received all eight vaccines.

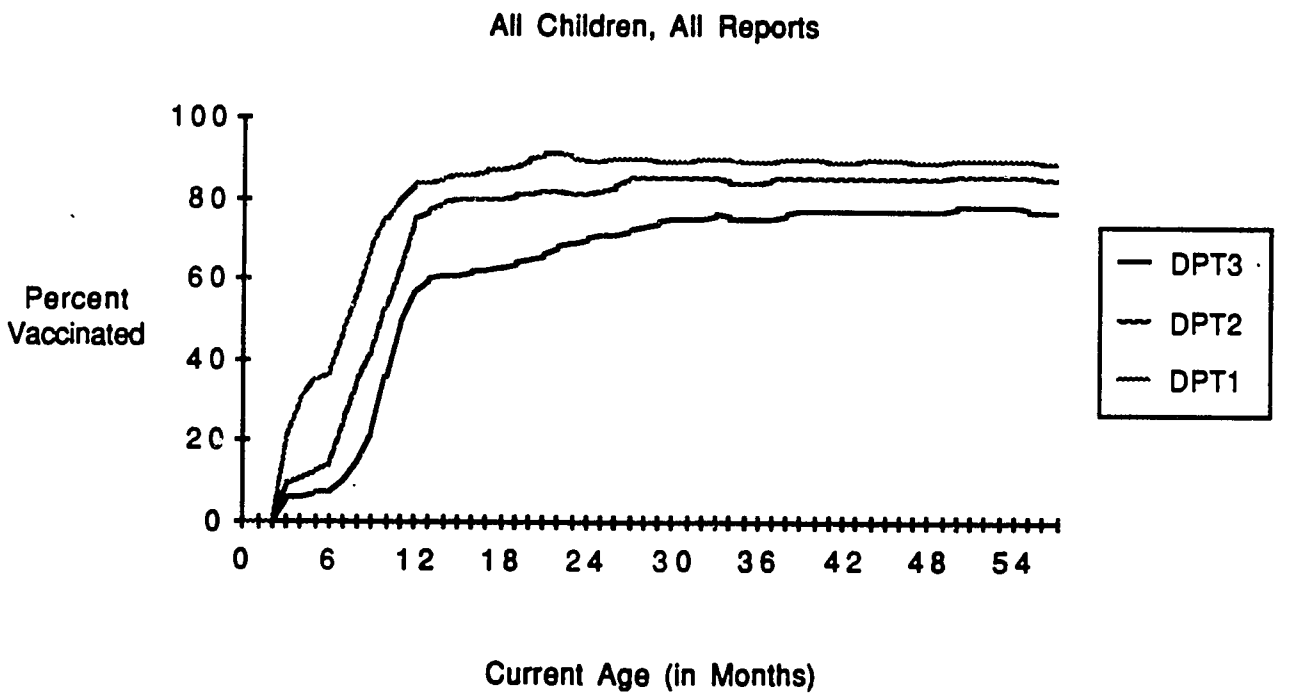
For a child to be fully immunized, eight vaccinations should be received: BCG (bacille calmette guerin) for tuberculosis, three doses of DPT (diphtheria pertussis tetanus; DPT1, DPT2, DPT3), three doses of polio (POL1, POL2, POL3), and measles (MEAS). WHO recommends that BCG be given soon after birth, the doses of DPT and polio be given together starting at age six weeks with one month between the successive doses, and measles be given at age nine months.

One conventional measure of coverage is the proportion of children between 12 and 17 months of age who have received vaccines. This coverage estimate for Guatemalan children is displayed in Figure 10. (Because DPT and polio are usually given at the same time, the rates for these vaccines are very similar; for ease of interpretation only DPT is shown.) In every case the rates calculated using caretakers' reports are at least 20 percent higher than those calculated using only the information from vaccination cards. However, both the high and low estimates show the same pattern: BCG appears to have the lowest coverage, with a minimum estimate of 13 percent and a maximum of 43 percent; and DPT1 is highest, with a minimum of 59 percent and a maximum of 90 percent. DPT2 and DPT3 show successively lower levels of coverage than DPT1, and measles is slightly lower than DPT3.

This pattern for the three DPT vaccines and measles indicates that some children probably dropped out of the vaccination process after each DPT vaccine. The low coverage for BCG compared to the other vaccines may be more apparent than real; if BCG is given right after birth the caretaker may be unaware that the child received it; in addition, it may not be noted on the vaccination card.

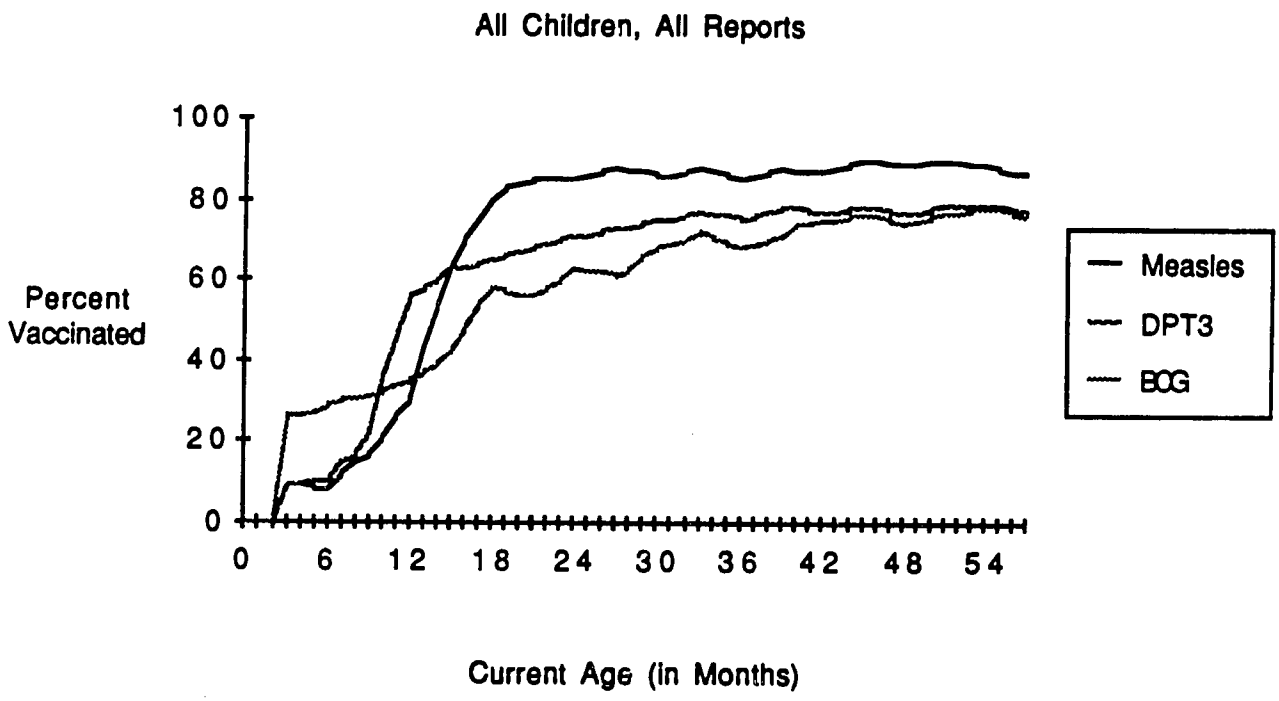
A second way to examine coverage is to look at the rates in a wider range of age groups. Figures 11 and 12 display coverage rates for all children less than five years old. Rates were calculated from caretakers' reports for each age group (in months); curves were smoothed using a three-month moving average, and every third point is plotted. DPT1, DPT2, and DPT3 show similar patterns of very steep increases between four and 12 months of age. DPT1 and DPT2 level off around 85 percent coverage at about 12 months, while DPT3 continues to increase gradually until leveling off around 80 percent coverage at about 30 months. Measles

FIGURE 11



Vaccine Coverage of DPT 1, 2, and 3

FIGURE 12



Vaccine Coverage of Measles, DPT3, and BCG

shows the same type of pattern, with the steepest increase starting later--around 12 months--and then leveling off around 18 months. The pattern for BCG is really quite different, with a much more gradual, but also steadier, rise.

The implications of this set of results are both cause for optimism and a source for concern. On the one hand, a reasonably high coverage rate for DPT, polio and measles (75 to 85 percent of children by their second birthday) was present among the children surveyed in February, 1987. However, the achievement of that coverage level was delayed well beyond the WHO recommended times for coverage. DPT3 coverage, for example, was only 35 percent for those who were 12 months old, even though it reached 75 percent for those who were 24 months old. Moreover, positive coverage may have been substantially a residual effect from the 1986 jornadas, discussed below. The sharp difference between 12 month old coverage and 24 month old coverage does not reflect only the effects of age. It reflects the particular vaccination programs that benefitted the older children and which hadn't benefitted the younger ones.

Timing and the Effects of Jornadas

Both the age pattern and the time pattern of coverage indicated that routine services were not doing the job in Guatemala. Whatever success was seen at the time of the survey reflected the special efforts undertaken through jornadas (intensive vaccination days) in 1986. However the jornadas, while they did sharply boost coverage, did not create a baseline coverage level which could be maintained through the operation of the routine system. The jornadas produced an effect, but when they were stopped, their effects disappeared.

The 1986 jornadas increased vaccine coverage, but not all vaccines given then were given to children of the appropriate ages. During the first 1986 jornada, in May, two-thirds of the DPT vaccinations given to youngest children were given to those who were more than six months old. This pattern contrasts with that of previous years, when only 28 percent of the children receiving DPT1 were more than six months old.

Of the measles vaccinations received during the jornada, only 25 percent were received by children in the highest priority age group--nine to twelve months old. Fourteen percent were received by children less than six months old. There is a risk that, because they still have maternal antibodies, children this young will not develop sufficient antibodies in response to the vaccine to protect them from measles. Sixty-one percent of the children who received vaccines

were more than a year old; at least some of these children were likely to have had natural measles before they were vaccinated.

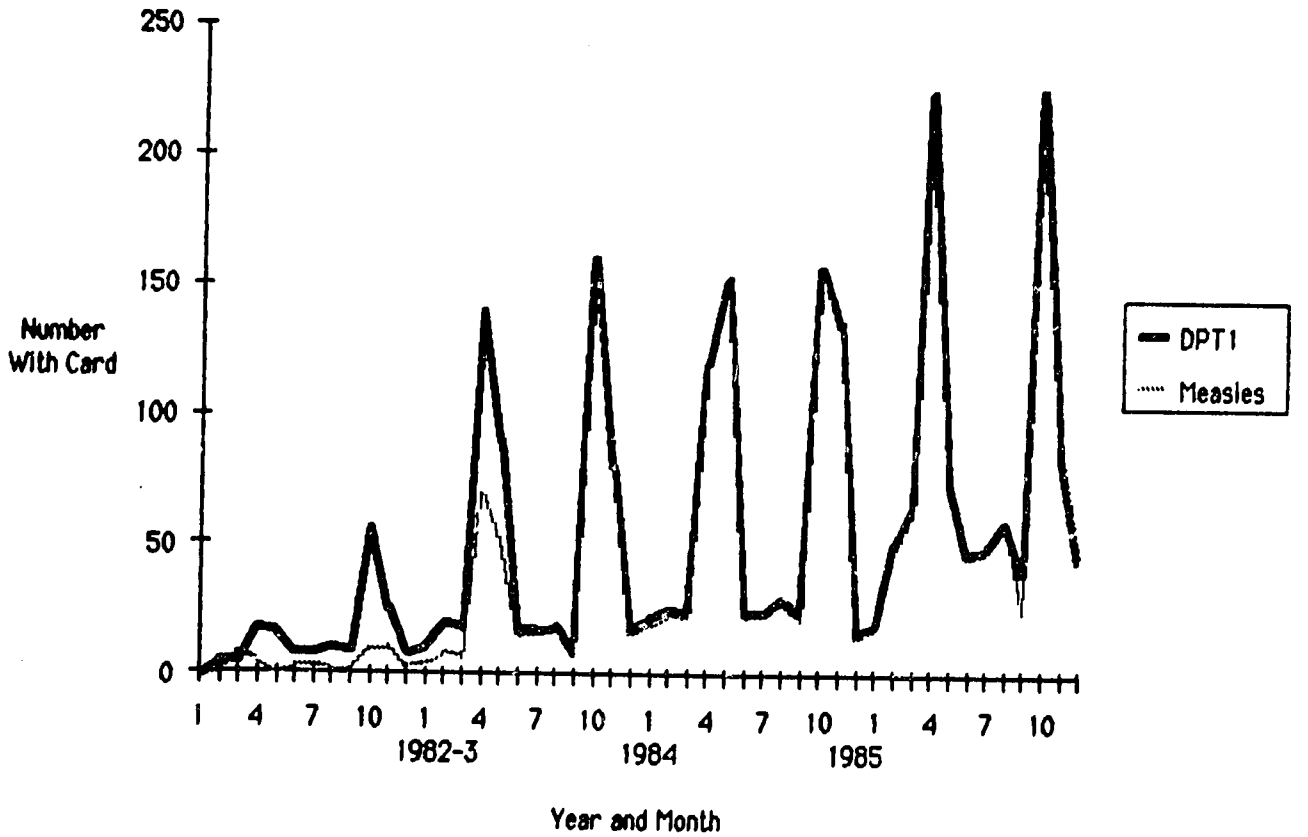
To examine the timing of vaccination, information from vaccination cards was used. This subset of all vaccinations may not be strictly representative.

Before 1986, there are regular large peaks in the number of measles and DPT1 vaccinations received in April or May and in October, and a smaller peak in August, indicating some special emphasis on vaccination at those times (Figure 13a). The first jornada in 1986 was held in May. From the card information its effect seems to have been at least ten times larger than that of any of the previous campaigns. Figure 13b shows that more children received DPT1 than measles, understandable when we remember that measles vaccine is not recommended for children less than nine months old. During the second jornada, in July, fewer DPT1 and measles vaccinations were given, although still about twice as many as during any of the efforts before 1986. The third jornada, in August, does not seem to have had any special effect on these two vaccines. This reflects the success of the approach: by the third jornada most of the catching up had been accomplished, and the number of children eligible for these vaccinations was much smaller.

That the third jornada did have an important effect can be seen from the plots for the number of DPT1, DPT2, and DPT3 vaccines given each month (Figure 14b). DPT1 accounts for most of the DPT vaccines given during the first jornada, DPT2 during the second, and DPT3 during the third. The difference in the height of the successive peaks reflects the dropout rate; if there had been no dropouts, we would expect the three peaks to be about the same size.

There is an alternative way to describe the striking effect of the jornadas. One measure of coverage for a particular vaccine (or for a set of vaccinations) is the proportion of children who received that vaccine by their first birthday. Making use of the date information on vaccination cards, for each child currently at least one year old, we can determine whether or not the child received the specific vaccination by the time he or she was one year old. Thus for any birth cohort of children (e.g. those born in September, 1985) we can specify the proportion who had measles by their first birthday. In turn we can plot that proportion against time, indicating for any given month (e.g. September, 1987 - for those born in September, 1986) what portion of those exactly 12 months old had the prescribed vaccination.

FIGURE 13a



DPT1 and Measles -- Before 1986

FIGURE 13b

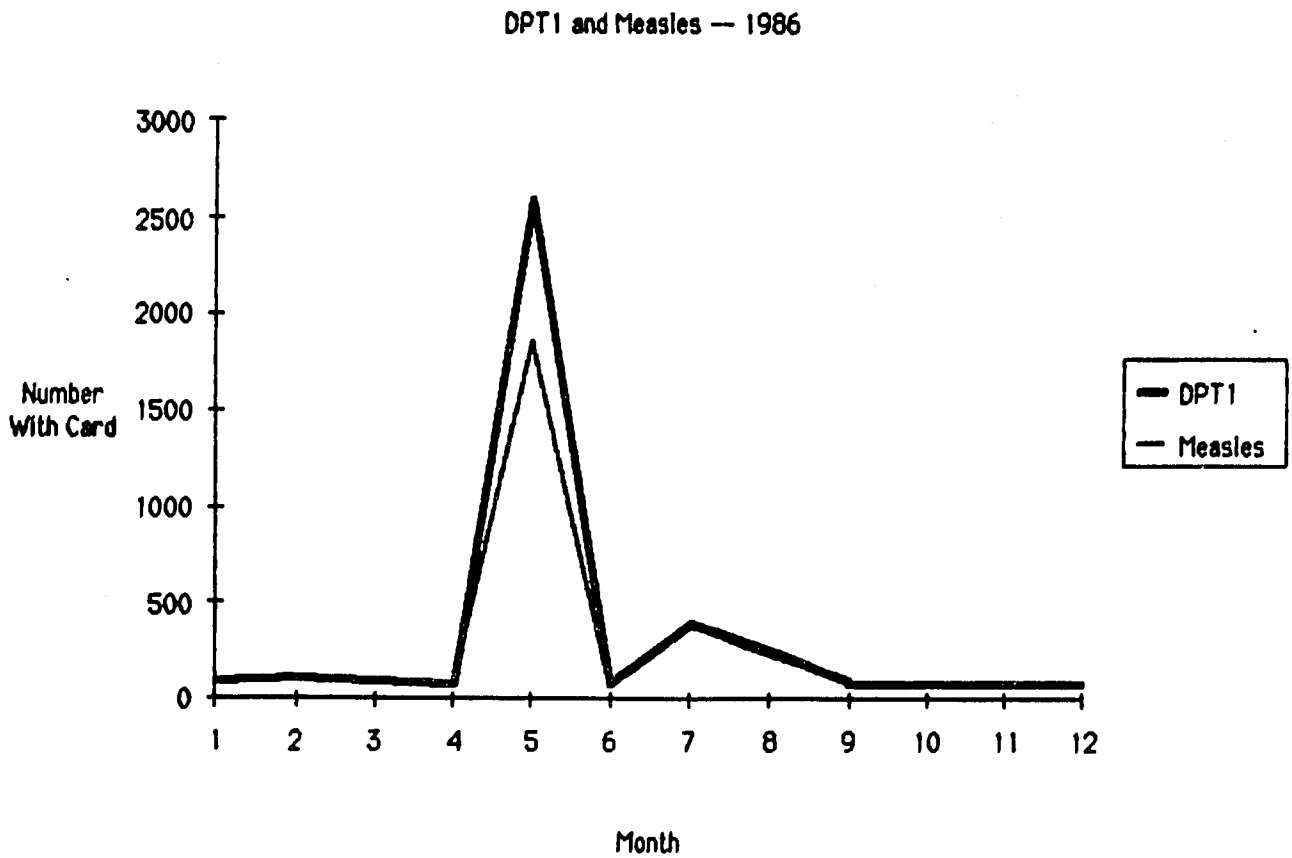
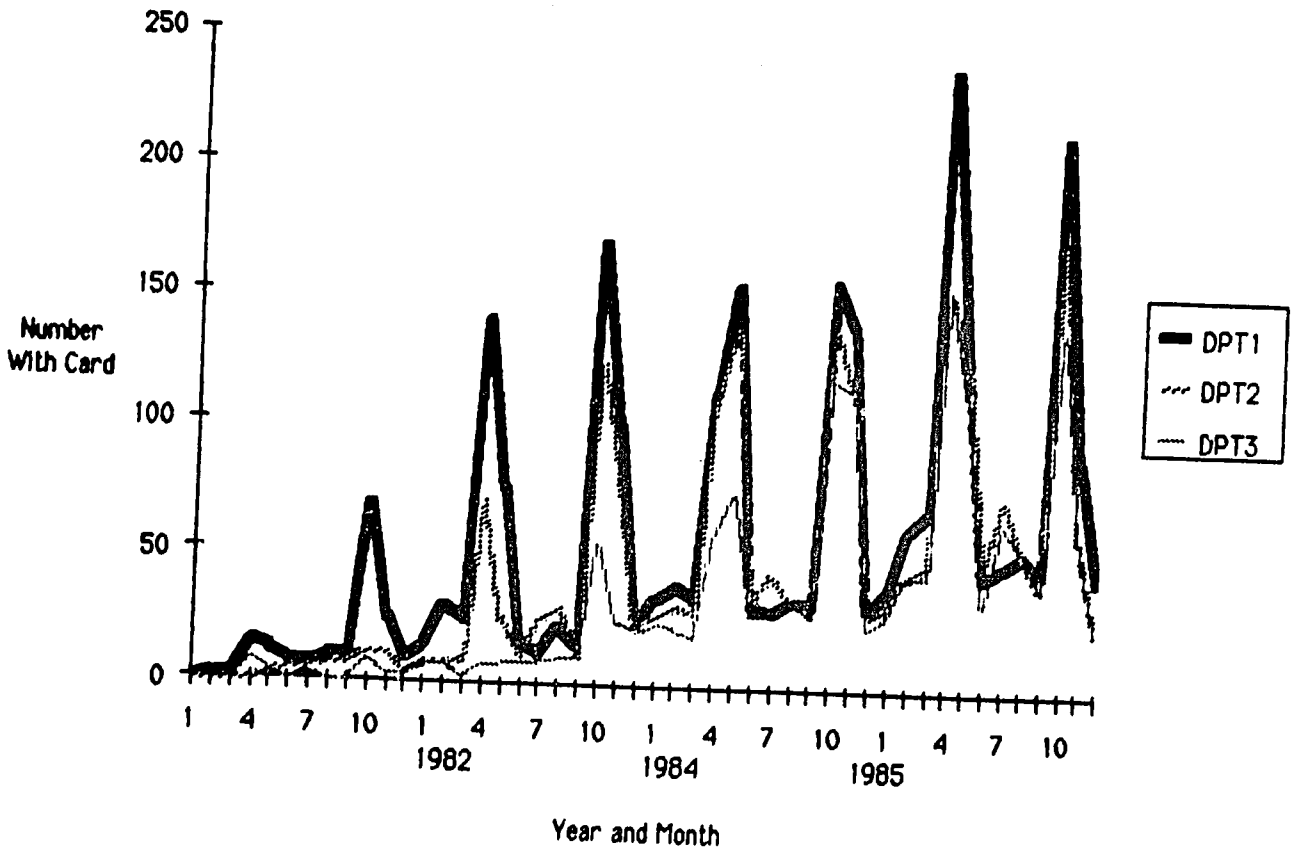
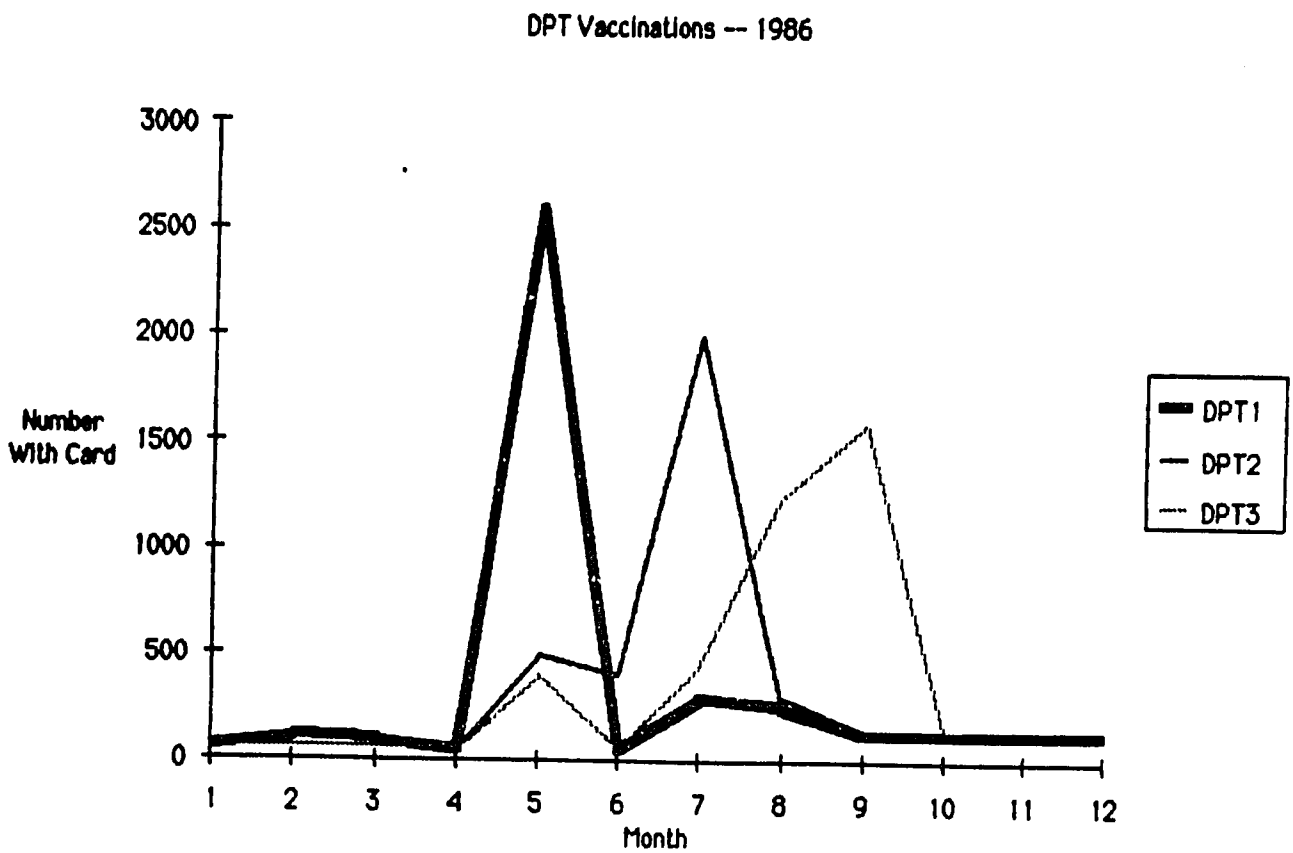

DPT1 and Measles — 1986
3000
2500
2000
1500
1000
500
0
Number With Card
1
2
3
4
5
6
7
8
9
10
11
12
Month
DPT1
Measles

FIGURE 14a



DPT Vaccinations -- Before 1986

FIGURE 14b


DPT Vaccinations -- 1986
3000
2500
2000
1500
1000
500
0
Number With Card
1
2
3
4
5
6
7
8
9
10
11
12
Month
DPT1
DPT2
DPT3

We know when particular jornadas have taken place. Comparing the dates of jornadas with observed exact age on coverage rates (in Figures 15 and 16), we can see clearly the large effects of the jornadas of 1986. After the May 1986 jornada, the measles coverage rate jumped to over 40 percent from a usual level of less than 20 percent (Figure 16). DPT 1 and DPT3 coverage also doubled. DPT1 coverage went from around 30 percent to around 60 percent; DPT3 coverage went from around 15 percent to over 40 percent (Figure 15). It stayed at that level for the following half year (which included two more jornadas) and then returned to a lower level among the children reaching their first birthday more than six months after the final jornada, in August. These estimates of coverage are lower bounds because only children with dates on cards are counted as having been covered. However, while this may make overall coverage lower than it appears, it is unlikely to account for the extraordinary pattern of effects associated with the jornadas.

HEALTH EDUCATION FOR THE POOR: CHANNELS AND THEIR LIMITS

Planning a health campaign requires that a target audience be identified and that appropriate channels for message distribution be selected. The poor people of a country are the neediest for health information. Mothers in households of lower socioeconomic status (SES) tend to have more ill children than those of higher socioeconomic status households and yet the poor mothers are the most difficult to reach. This section of the field note discusses the composition and health status of the population of Guatemala and then examines possible channels for disseminating health information to different socioeconomic groups. It concludes by suggesting channels to be investigated for future health campaigns.

Composition of SES populations

Those respondents with higher levels of SES were predominantly Spanish speakers. The eight poorest states were Totonicapan, Huehuetenango, San Marcos, Retalhuleu, Santa Rosa, Baja Verapaz, Alta Verapaz, and Jalapa. The two wealthiest were Guatemala and Izabal.

Figure 17 shows that 22 percent of the people who spoke Spanish at home fell within the three highest categories of SES, compared to five percent of the Quiche, four percent of the Kakchiquel, four percent of the Kekchi, and two percent of the Mam. It follows that the poorest

FIGURE 15

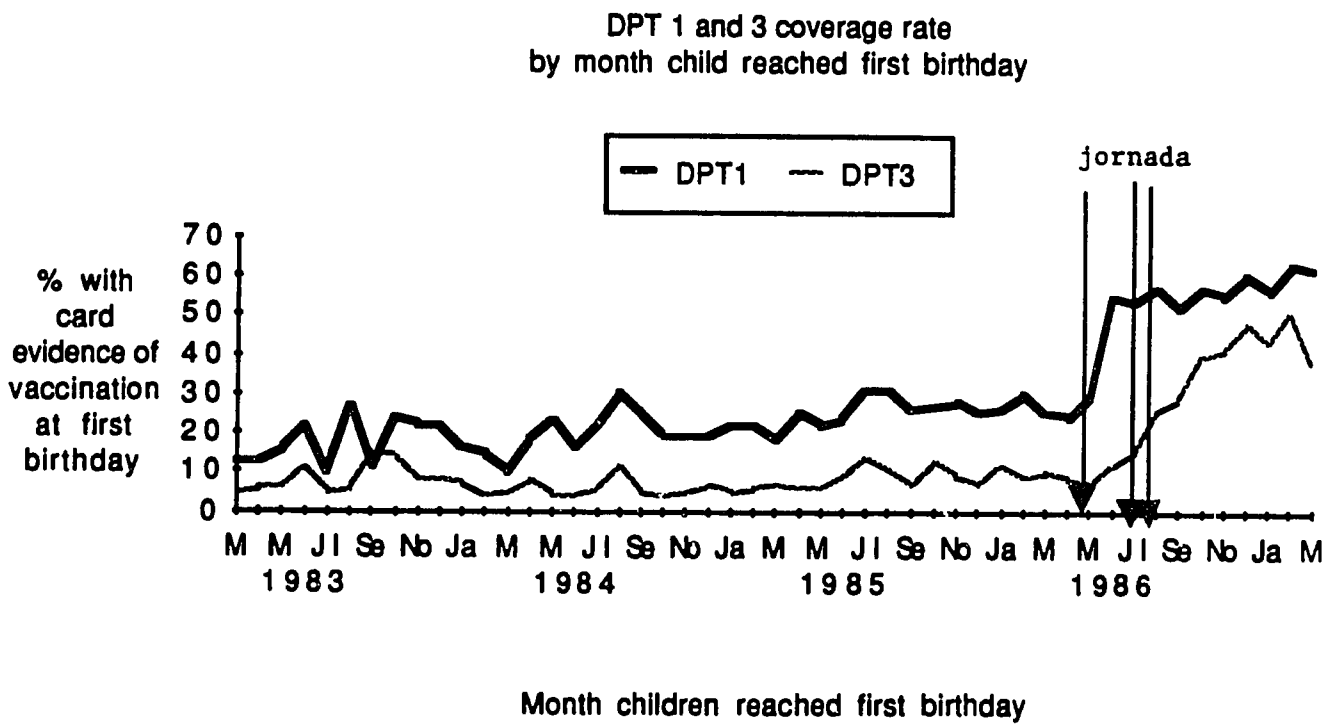

DPT 1 and 3 coverage rate
by month child reached first birthday
DPT1
DPT3
jornada
% with card evidence of vaccination at first birthday
70
60
50
40
30
20
10
0
M M J I Se No Ja M M J I Se No Ja M M J I Se No Ja M M J I Se No Ja M
1983
1984
1985
1986
Month children reached first birthday

FIGURE 16

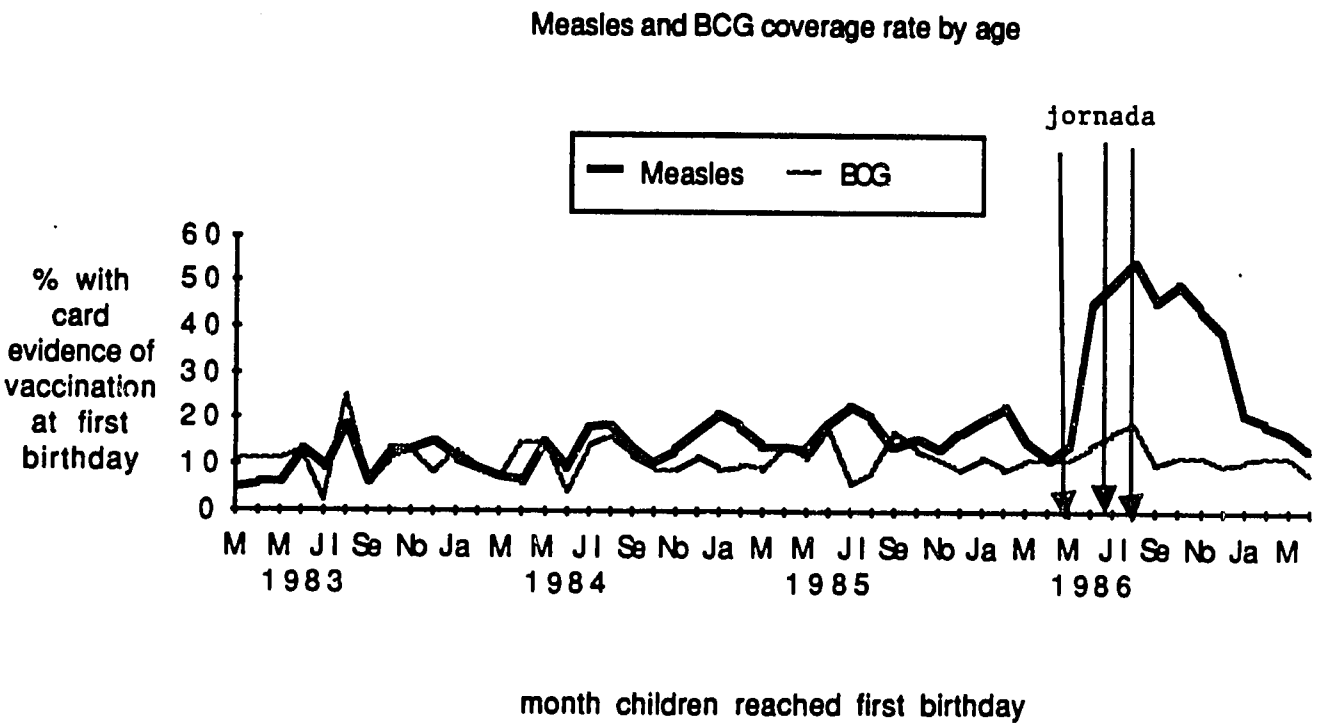
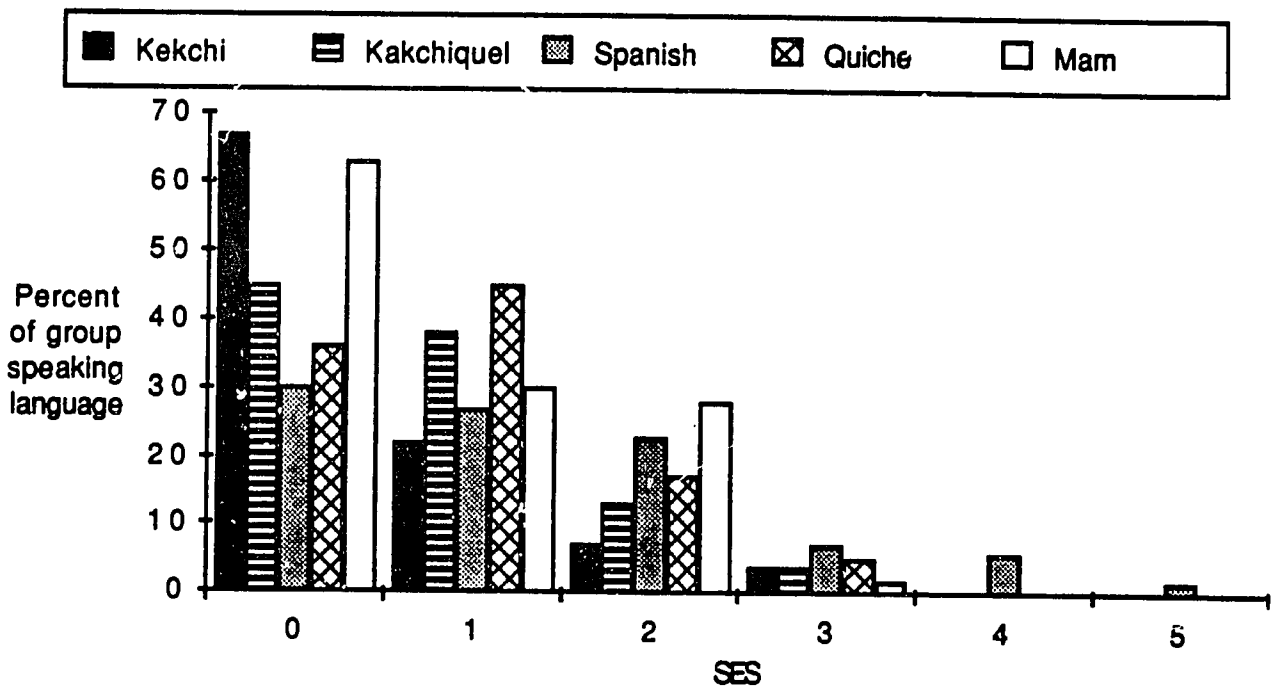

Measles and BCG coverage rate by age
jornada
Measles
BCG
% with card evidence of vaccination at first birthday
60
50
40
30
20
10
0
M M J I Se No Ja M M J I Se No Ja M M J I Se No Ja M M J I Se No Ja M
1983
1984
1985
1986
month children reached first birthday

FIGURE 17



Socioeconomic Status of Language Groups

people, those with zero points on the SES scale, were non-Spanish speakers. Most of the Mam (62 percent) and Kekchi (68 percent) were found at this level, as well as many of the Kakchiquel (45 percent) and Quiche (36 percent). In comparison, 30 percent of the Spanish speakers were at this level of poverty.

Health Status of SES Groups

Diarrheal Incidence. It appears that diarrhea affects most children, although less so among those in the highest SES categories (Figure 18). In the higher SES categories, a few more parents reported no cases of diarrhea at all in the last year and many more reported no recent case than parents in the lower SES categories. For example, nearly 50 percent of those parents in the lowest SES category reported a current or past month case; fewer than 30 percent of those in the highest SES category reported similar recent cases.

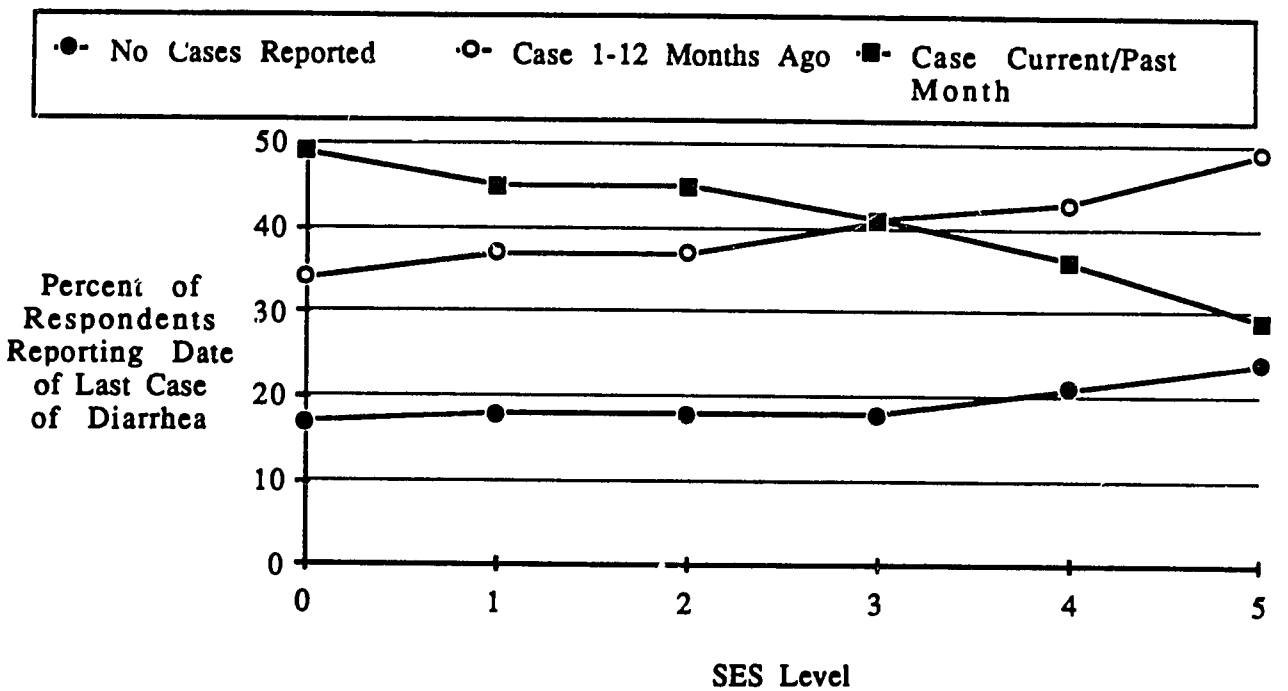
Vaccinations. Figure 19 shows the percentage of those in each SES level with each vaccination (accepting card and self-reported data, including children from 12-48 months old). In general, fewer of those children in lower SES levels had been vaccinated, compared to those in higher SES levels.

Mass Media

Radio. While radio ownership did increase with each level of SES, over half of those in the lowest SES level had a radio (53 percent). Figure 20 shows that between 65 to 76 percent of those in the next two levels had radios, 84 percent of level 3, 91 percent of level 4, and 96 percent of level 5. Also, the dispersion of radios throughout the communities might have allowed for diffusion of information among mothers. Only about one percent of the communities surveyed (N=462) had 25 percent or less of its population owning a radio.

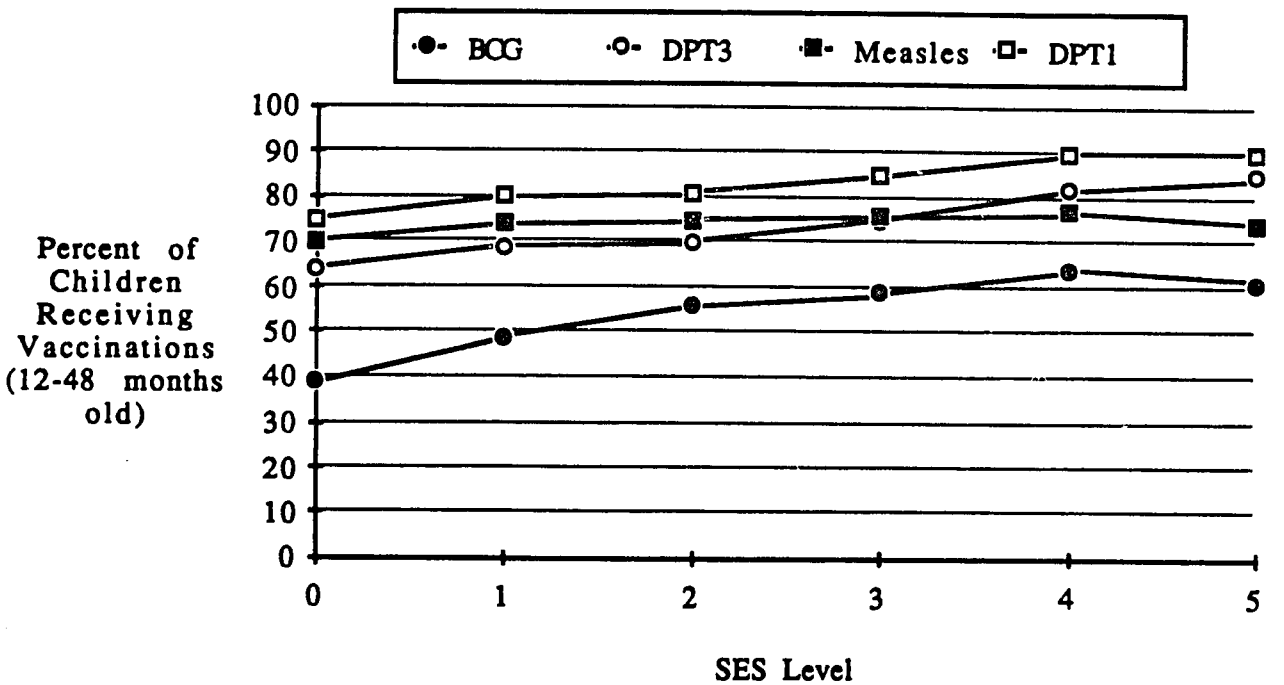
Television. Television ownership, on the other hand, showed a more drastic slope from the lowest to highest SES levels. Only three percent of the poorest level of SES had televisions in their home, 12 percent of those in level one, 35 percent in level two, 58 percent in level three, and between 80 and 89 percent in the highest two levels (Figure 21). Television ownership was concentrated in some communities and not in others. About 44 percent of the communities surveyed (N=462) had a population with five percent or less owning televisions.

FIGURE 18



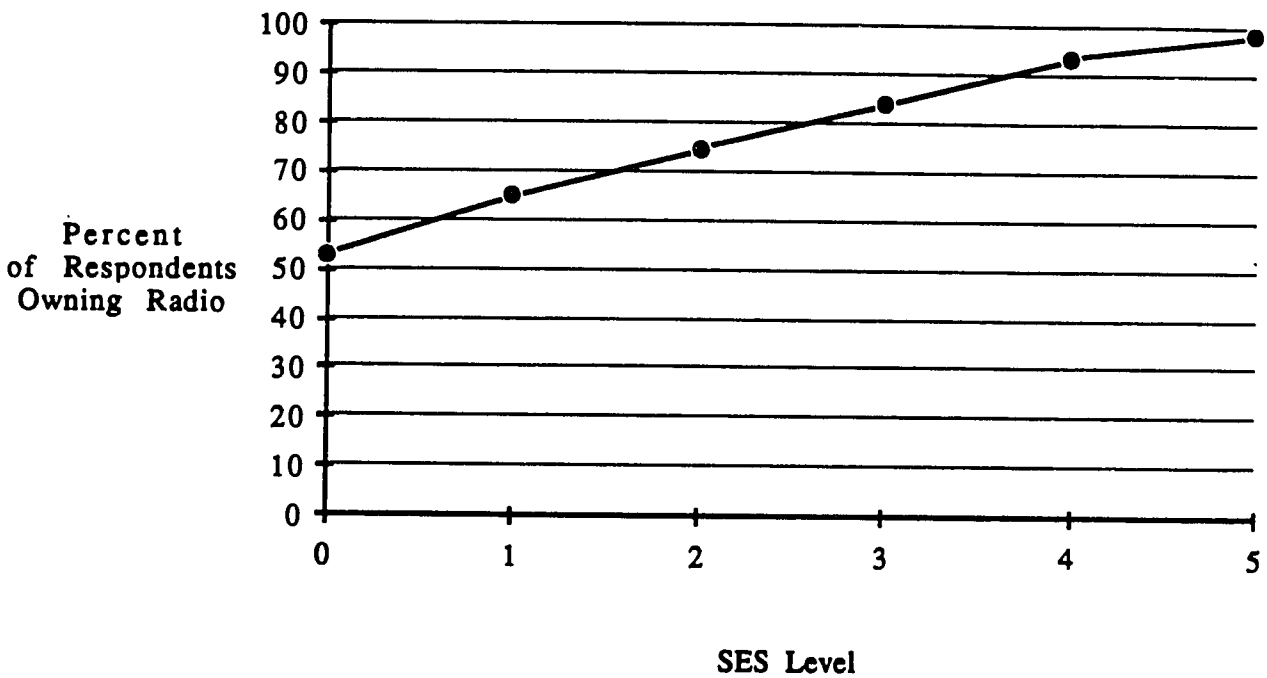
Cases of Diarrhea for Each Socioeconomic Status Level

FIGURE 19



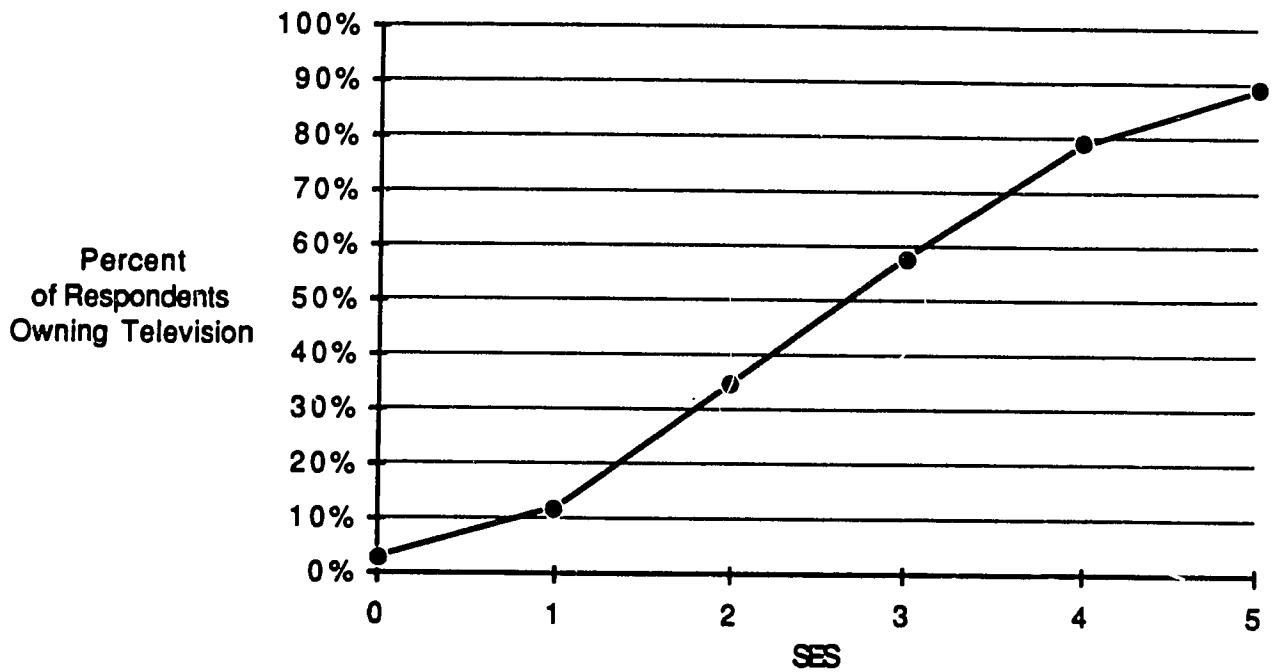
Vaccinations for Each Socioeconomic Status Level

FIGURE 20



Radio Ownership by SES Levels

FIGURE 21



Television Ownership by SES Levels

Print. As shown in Figure 22, SES levels in Guatemala were highest among the Spanish speaking population. It is expected then that the ability to read Spanish will increase with each SES level. The graph shows that 97-100 percent of the highest two SES levels read Spanish, 68-84 percent of the middle two levels, 48 percent of the next lowest level, while only 33 percent of the poorest group reported to be able to read Spanish.

Interpersonal

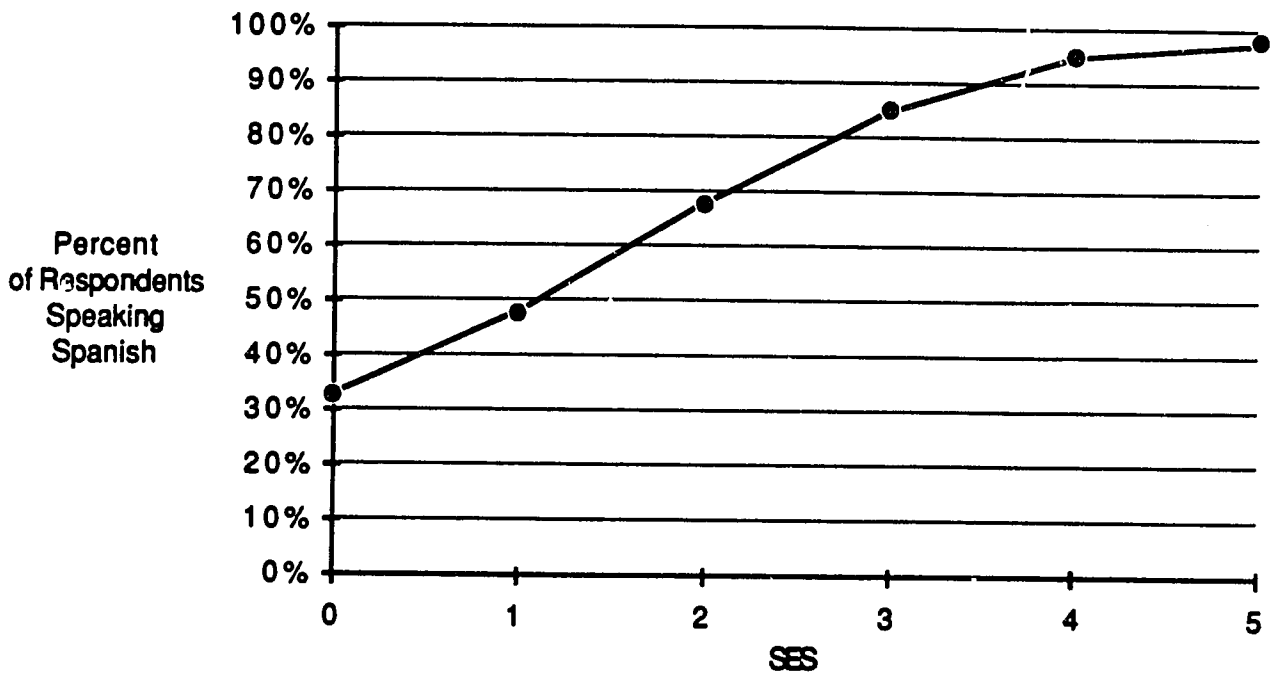
Health Volunteers. The health volunteer system, as it operated during the time of the interviews, did seem more likely to reach those in lower SES levels than those in higher SES levels. Figure 23 shows that between seven to ten percent of those in the three lowest categories had been contacted by a health volunteer in the past year, compared to two to five percent of those in the three highest categories. However, these percentages are still quite low in terms of reaching the population.

Institutional

Public Health Centers. Most of those in the lowest SES levels had visited a health center in the past year (59-65 percent in the four lowest categories), while slightly less than half of those in the two highest SES levels (about 48 percent) had visited one in the past year (Figure 24). It is assumed that the wealthier people are filling this gap with the use of private physicians.

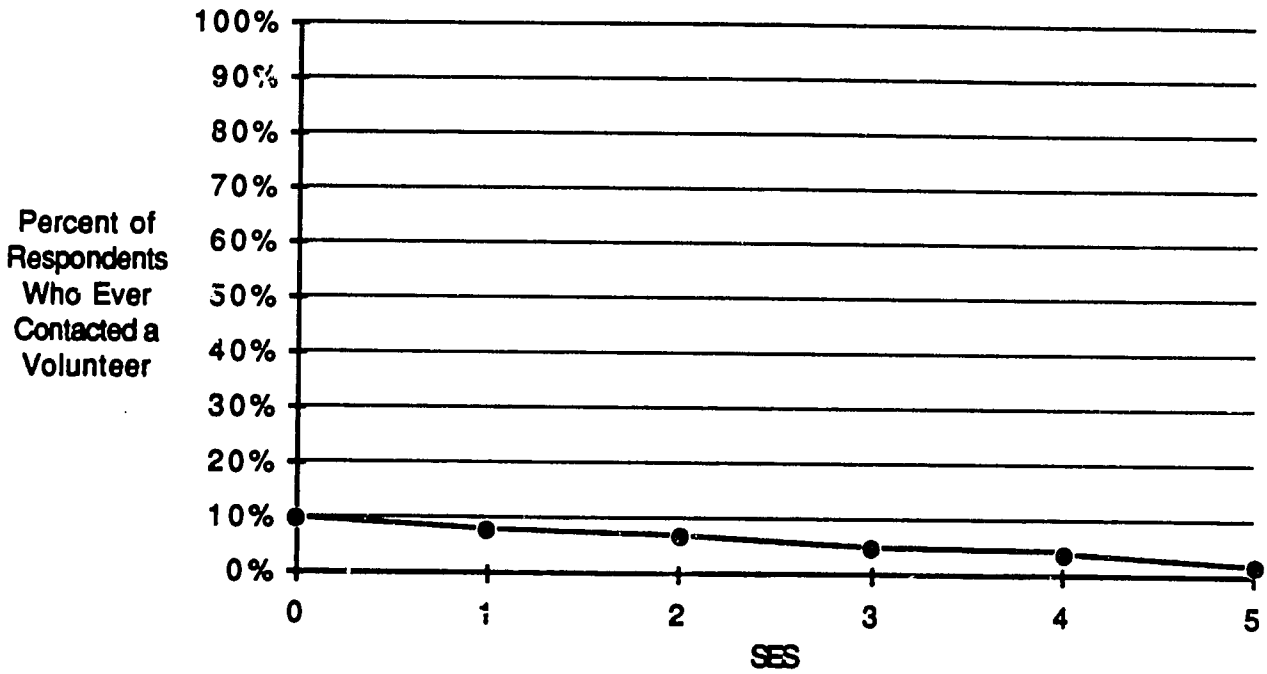
About 11 percent of the communities surveyed (N=462) were located over an hour away from a health center. Actually, those mothers in the lowest SES level were more likely to have had a health center over an hour away than those in any of the other levels. Fourteen percent of those in the poorest SES level report that the health center was over an hour away, compared to eight percent in level one, four percent in level two, two percent in level three, and one percent in levels four and five (though the percentage of "never visit" in levels four and five was high). It appears then that health centers mostly reach those in levels one through three, not the richest in four and five, or the poorest in level zero who tend to live farther away.

FIGURE 22



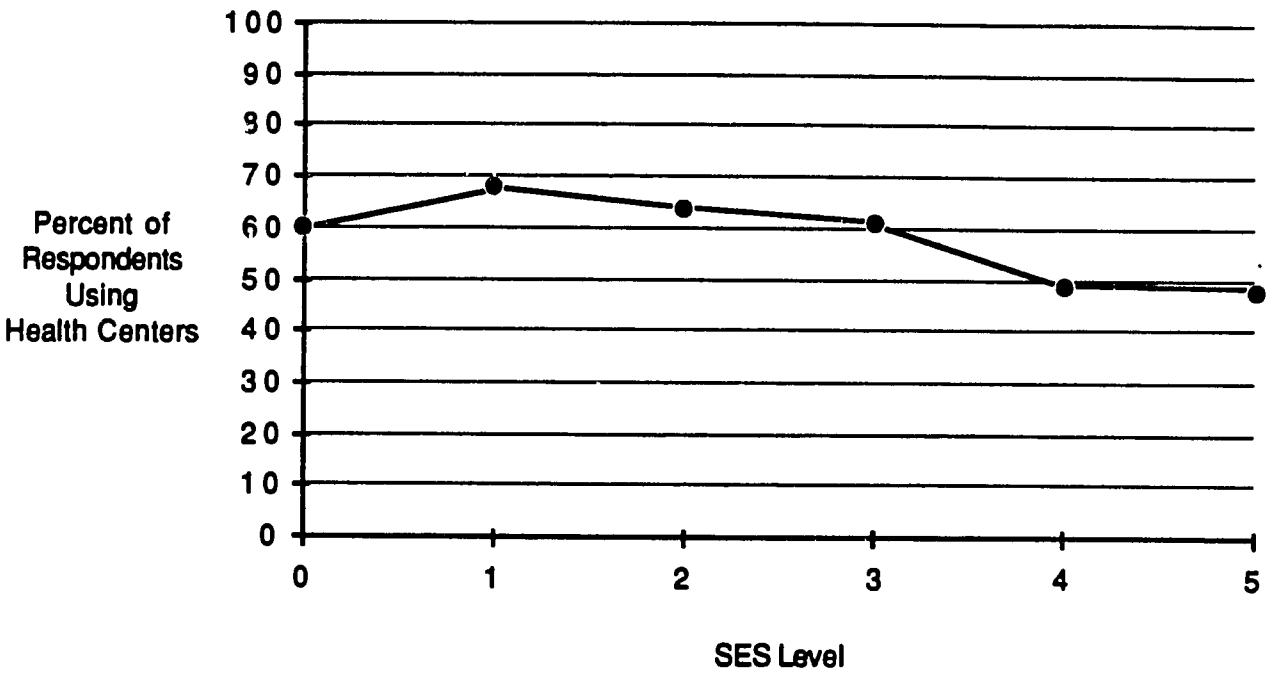
Spanish Literacy (reading) by SES Levels

FIGURE 23



Volunteer Contact by SES Level

FIGURE 24



Health Center Use by SES Levels

SUMMARY

It appeared that any of the mass media would reach those in the highest SES levels. Over 80 percent of those in the three highest SES levels were able to read Spanish, and over half had televisions. Also, 80 percent or more of this group owned radios.

However, those in the lowest SES levels are not so easily reached by those channels. Less than a quarter of the two lowest groups owned televisions, and just under half of all communities had less than five percent television ownership. Also, print would not be likely to reach the poorest groups. Less than half of the population in the two lowest SES levels was able to read Spanish at all. This leaves radio--the mass medium with the potential to reach more than half of even the poorest in Guatemala at the lowest estimate, and up to 99 percent as a high estimate.

The health volunteer system did appear to be focused on the lower SES levels, but these volunteers did not reach even a quarter of the population. This system does not effectively reach large numbers of mothers.

Health centers are able to reach most of the population because almost 90 percent of the sample communities were within one hour of the clinic (distance mostly affecting those in the poorest level of SES). Health centers were used more by those less well off than by those mothers with relatively higher levels of SES who are assumed to have used private physicians. It was noted previously in this field note that only one-third of the population had visited a clinic in the past month, and that given frequent diarrheal episodes, this may mean that clinic contact is infrequent. Therefore, clinics may be an appropriate channel for reaching poor groups and distributing ORS, but this should not be the only channel in a campaign.

Overall, it appears that radio and institutional channels would be the most equitable distributors of messages to the population. Diarrhea incidence appears to affect those children from most SES backgrounds, so perhaps an ORS campaign might use radio, health centers, and private doctors to reach the population. Vaccination information needs to reach the poorer mothers, those whose children tend to be vaccinated less often than those of wealthier mothers. In order to reach the poorest mothers in Guatemala, those who live farther away from health centers and tend not to have access to television, print, or health volunteers, the use of radios should be vigorously pursued.