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5. Author(s)

1. P. Stanley Yoder
2. Zhong Zheng
3. Kathy Dusenbury

6. Contributing Organization(s)

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LESOTHO HEALTH SURVEY
KNOWLEDGE AND PRACTICES RELATED TO DIARRHOEA,
ORAL REHYDRATION, VACCINATIONS,
AND VISUAL PERCEPTION

Center for International, Health, and Development Communications
Annenberg School for Communication
University of Pennsylvania
Philadelphia, PA

May 1990

P. Stanley Yoder
Zhong Zheng
Kathy Dusenbury

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1. SUMMARY OF RESULTS AND COMMENTARY

1.1 Diarrhoea and Treatments

1.11 Among the 1016 households visited in the survey, 10% had a case of current diarrhoea and 19% a case that had occurred less than one month ago. These current and recent cases, known here as "recent cases," are the ones analysed in examining symptoms observed and choice of treatment for diarrhoea (N=288).

1.12 Nineteen percent of all recent cases received no treatment at all. Almost three-fourths (72%) of diarrhoeal cases were treated in the home. Most cases of diarrhoea that were treated at home received either SSS or ORS. Otherwise stated, 78% of those treated at home received SSS or ORS, while 56% of all recent cases reported, received SSS or ORS at home.

1.13 Just over one-fourth (N=82, 28%) of all recent cases of diarrhoea were taken to health facilities for treatment. Sixty-three percent of recent cases taken to health facilities were given SSS or ORS. This can be compared to the proportion of cases treated at home that received either SSS or ORS, which was 78%..

1.14 The results of this survey with regard to treatment of diarrhoea differ in some respects from the results of the one conducted in November 1987. One, the percentage of cases not treated at all dropped from 38% to 19%. Two, the percentages of recent cases given SSS or ORS at home increased from 37% to 56%. This may be largely a reflection of the increase in treatment at all. Three, enemas were not mentioned at all as given at home, while in the earlier survey, 7% of recent cases had received them at home. Fourth, health care facilities currently give far fewer pills and syrups now than in late 1987, and they are far more likely to give SSS or ORS. In the 1990 survey 63% cases of diarrhoeal cases brought to Health Centres were given SSS or ORS, while the figure for 1987 was 32%. That constitutes a marked improvement.

COMMENTARY The proportion of mothers that chose to do something for cases of diarrhoea has increased in the past two years. The pattern of treatment at health facilities has changed, in that fewer pills and syrups are given, while more SSS and ORS is being given. The cause of the former change is difficult to pinpoint, while the latter change is likely the results of retraining of health care personnel. The MOH should continue its present programme of retraining health care personnel in ORT, for it appears to be producing results.

1.2 Knowledge and Use of SSS and ORS

1.21 While most women (90%) have heard of SSS and three-fourths say they know how to prepare SSS, in fact, less than one-fifth of those interviewed were able to state the correct proportions of the ingredients as promoted by the Ministry of Health. About one-half gave the right amount of water, and less than one-fifth gave correct amounts of sugar and salt. Between 15% and 20% of those who gave a recipe for mixing SSS cited a quantity of salt that, if mixed with a litre of water and given with no other fluids, might be toxic.

1.22 Twice as many women knew the proportions for mixing ORS correctly than for mixing SSS. While 20% of those who gave a recipe for SSS were able to give the right one, 86% of those knowing about ORS were able to give the right quantity of water for one packet.

1.23 Knowledge of how to mix SSS has not changed since 1987. Knowledge of ORS packets has improved slightly.

1.24 The proportion of persons who had ever used SSS for diarrhoea in a child remained essentially the same (increase from 67% to 74%). Similarly, the percentage of women who had ever used ORS packets rose a little (from 31% to 36%).

1.25 The proportions of those who gave SSS or ORS at home increased slightly, from 70% to 78%. The proportion of cases brought to health centres who were given SSS or ORS went from 37% in 1987 to 63% in 1990. When both home and health centre treatment are combined, we find that in 1990, 69% of all recent cases were given SSS or ORS. In 1987 the figure was only 42%. Thus, while ever use increased only slightly, use of SSS for a recent case of diarrhoea increased significantly.

COMMENTARY The most obvious place with a need for improvement in the promotion of the use of ORT by the MOH is the mixing of SSS. While the use of SSS has increased, knowledge of correct mixing has not. This suggests that the MOH should make a greater effort to teach women to mix SSS properly, for too many still make mistakes. Since 68% of recent cases of diarrhoea were given SSS, it seems crucial that the correct proportions be used. Otherwise the MOH should abandon the promotion of SSS and promote ORS packets. It is also true that women make fewer mixing errors when they use ORS packets than when they mix SSS.

1.3 Vaccination Coverage

1.31 The rate of completion for all vaccinations for children 12-23 months old is about 70%.

1.32 The drop off from DPT1 to DPT3 and Pol1 to Pol3 for the 12 to 23 month old children is from 3% to 6% for both card information and verbal report. The drop-off from BCG to measles from card information is only 10%.

1.33 Only two-thirds of all mothers/caretakers were able to show vaccination cards, while 72% of mothers of children less than two years old showed a card.

1.34 Over the past two years the percentage of children who receive DPT1 by the age of two months has been around 70% for children with cards. Before that point about 20% were receiving DPT1 by two months. The change in government policy seems to have had a strong effect.

1.35 Judging from card data only, over the past five years the proportion of children who receive BCG at two weeks of age has slowly risen from about 30% to around 70%. The increase has been particularly marked in the past year.

1.36 The results of this survey shows that while overall coverage rates appear to have dropped slightly, there is no statistical difference in the coverage rates found by the 1990 and the 1987 survey.

1.37 There is a positive relationship between knowledge of vaccinations and completion rates.

COMMENTARY The MOH should concentrate on improving the distribution and use of cards by health facility personnel and mothers. This should include helping mothers keep the cards at home properly. While the overall coverage rates have not increased in the past two years, the proportion of children receiving BCG and DPT1 on time in the past three years has increased.

1.4 Radio Listenership

1.41 About two-thirds (66%) of the women listen to the radio, and 55% of all women say they listen every day.

1.42 Listening to the radio is not evenly distributed throughout the country. Among the group who listen at all, 81% of urban women, 71% of those in the lowlands and the foothills, and 55% of those in the mountains, listen every day.

1.43 Only 39% of women said they had ever listened to a programme on the radio about the health of children. Eighteen percent of all women listened to a health programme during the past week.

1.44 Among the women who had heard a health programme, 56% said they did not know the name of that programme, and 30% said it was Bophelo ba Rona. Thus about 12% of all women could name the health programme.

1.45 While diarrhoea, health in general, and AIDS are subjects mentioned fairly frequently on the radio, vaccinations are rarely discussed, according to the recall of those interviewed.

COMMENTARY Radio producers should make a special effort to create an identity for their programme, a name that would help people remember the programme. They should also prepare more special programmes concerning immunisations for the public.

1.5 Visual Perceptions of Printed Materials

1.51 Mothers were more likely to understand the individual illustrations of the brochure than to comprehend the overall message of the brochure.

1.52 Thirty-seven percent of all mothers claimed to have seen the brochure before. Mothers living in the lowlands were most likely to recognize the brochure.

1.53 Pictorial ability, level of education, past experience with pictorial material and knowledge of correct ORT mixtures were all found to be positively related to comprehension of the brochure. Pictorial ability appears to be the most important factor in determining individual comprehension.

1.54 Depth perception and lines depicting motion were the pictorial conventions that posed the greatest problems for mothers. While 63% of the women were able to describe a series of pictures in correct order, only 55% interpreted them as one narrative.

COMMENTARY Even if a woman has seen a pictorial brochure before, her own level of pictorial ability will be important in determining her level of comprehension of the brochure. Health education materials should be developed to be understood by all, including those of more limited pictorial ability and experience. Designers should give special attention to using illustrations that require little interpretation of depth and motion. In cases where they design a series of pictures, they should make that series as cohesive as possible and indicate the order in which the pictures should be read.

2. INTRODUCTION

2.1 Background to Survey**

In March of 1990, the Annenberg School for Communication (ASC) at the University of Pennsylvania, in collaboration with the Health Education Division (HED) of the Ministry of Health (MOH) of Lesotho, conducted a national survey among women with young children in Lesotho. This research was conducted as part of the evaluation of HEALTHCOM, a health and communications project associated with the HED and administered by the Academy for Educational Development of Washington, D.C. The questions asked of women concerned their recognition of diarrhoeal disorders, their choice of treatment for diarrhoea, the immunisation status of their children, their habits of listening to radio programmes about health, and their experience with seeing printed materials.

This report presents selected results of the analysis of the survey data and makes certain recommendations for improvement of the MOH efforts to promote the use of ORT for diarrhoea and increase vaccination coverage rates. Several contrasts between the results of this survey and the previous one (November 1987) are also given. A full comparison of the results of the 1987 and the 1990 survey will be a major part of the final evaluation report.

2.2 Survey Objectives

The survey was designed to provide information about certain aspects of MOH programmes to promote vaccination of children and the use of oral rehydration for diarrhoea. Special emphasis was placed on examining the diffusion of health education messages from the HED having to do with those same programmes. It was thought that an analysis of the survey results might identify populations that are more (and less) affected by messages about the health of young children, as well as provide the basis for comparison with

**Many people from the Ministry of Health contributed very generously of their time and resources to facilitate this survey. Most importantly, Mokuba Petlane, the head of the HED and Chief Health Educator, made available the resources of the HED to assist us in the survey. Dr. Edward Douglass, the HEALTHCOM Resident Advisor, shared much of his time and knowledge. N. Islam took charge of supervising the data entry process. It was a pleasure to work with the two persons from the HED designated to assist with the survey, Mamello 'Moleli and Mahlapane Letsometsa. We also want to thank Lipholo Makhetha for his excellent work in choosing the sample and organizing the travel, and Fred Moswang for his astute work in public relations.

the results of the earlier survey to determine what changes in ORT use and vaccination coverage could be identified. The results of that comparison would then become part of the data to be considered in the evaluation of the overall impact of the HEALTHCOM Project in Lesotho.

2.3 Purpose of This Report

This report was written with three goals in mind. First, it will provide the MOH of Lesotho with certain results of the data analysis that may have programmatic implications for the Expanded Programme on Immunisation (EPI) and the Control of Diarrhoeal Disease (CDD) programmes as well as for the work of the HED in general. Second, a limited amount of interpretation of the data has been done to explain some of the variations in ORT use and vaccination coverage as well as to identify changes in knowledge and behavior when compared to the earlier survey. Third, the report anticipates in many ways the central themes of the final evaluation report which will include more extensive analysis of the data as well as the description of HEALTHCOM activities and accomplishments and the process of institutionalization.

2.4 Conducting the Survey

The survey was planned with the close collaboration of the head of the Health Education Division who also designated two members of his staff to assist with the survey. A total of 19 interviewers were trained for two weeks before beginning actual interviewing. A total of 1016 women who were mothers or caretakers of children less than five years old were interviewed with a closed-ended questionnaire. The sample was chosen with information from the Bureau of Statistics and was based on demographic information from the 1986 census. A cluster sample was chosen by selecting 40 enumeration areas: 34 enumeration areas, or clusters, were chosen in rural areas and six in urban areas. Enumeration areas adjacent to those used in the earlier sample were chosen to maximize comparability between the two samples. Approximately 25 women were interviewed in each rural cluster and 35 in each urban cluster.

Several social and demographic characteristics of our sample should be noted as background information. Eighty-three percent of the women interviewed were mothers of the children in question, and 17% were caretakers. The mean age of the mothers was 29 years, while that of the caretakers was 42 years. There were 228 women with a second child less than five years old, and eight women had three children less than five years old. The mothers had an average of 3.2 children in all. Reported reading ability was extremely high; 92% of the women said they could read in Sesotho while 31% said they could read in English. Only 6% of the women had never been to

school. While 77% of the women were married, 9% were widowed and 4% were divorced. About 58% of the married women had husbands working in South Africa.

3. DIARRHOEA AND TREATMENTS

3.1 Cases of Diarrhoea: Frequencies

Each of the mothers or caretakers interviewed was asked if one of her children under five years old had a current or recent case of diarrhoea. In the 1016 households of the sample, the survey found 99 current cases of diarrhoea, or 10% of the households. One hundred eighty-nine cases of diarrhoea had occurred within the past four weeks prior to the survey, or 19% of the households. The number of cases reported as having occurred from 1 to 3 months ago was 177, or 17% of the households. Table 1 below shows the proportions of reported cases of diarrhoea by time they occurred.

TABLE 1

TIME OF REPORTED CASES OF DIARRHOEA

<u>Time</u>	<u>Number</u>	<u>Percentage</u>
Current	99	10%
1-4 weeks ago	189	19%
1-1 1/2 months ago	107	10%
2-3 months ago	70	7%
More than 3 mo.	244	24%
Don't know	28	3%
Never had diarrhoea	<u>279</u>	<u>27%</u>
	1016	100%

While the percentages of current and recent (within past month) cases reported in this table fall within the range expected, the percentage of children who never had diarrhoea appears abnormally high. Part of the reason is the high proportion of children three months old or younger (11%), yet that does not explain everything. It also appears likely that some mothers chose to state their child never had diarrhoea even if that was not accurate. It should also be noted that these figures reflect household prevalence of

diarrhoea rather than individual prevalence, for the mothers or caretakers were asked if any of her children under five had a case of diarrhoea.

The analysis of the data in the next sections concerns women's perceptions of symptoms and their recollections of actions taken in response to those symptoms. Many previous analyses have shown that women tend to forget details about cases of illness that occurred several months ago. Therefore, in the consideration of symptoms identified and treatments chosen, we examine only recent cases of diarrhoea. For our purposes "recent cases" are episodes of diarrhoea that were either current or that occurred within the four weeks prior to the interview. Thus the analyses of the next sections uses the 99 current cases plus those that occurred within the past four weeks (N=189), which yields a total of 288 recent cases.

3.2 Treatment Choices

The treatments chosen for diarrhoea were examined in terms of where (from whom) treatments were sought and what was actually given. The source of the treatment is important to note because the treatments most commonly given differ according to the sources (mother, family member, traditional healer, chemist, nurse, etc.). For instance, traditional healers usually give Sesotho medicine or enemas, mothers at home most often give the water/sugar/salt solution (SSS) for diarrhoea, while nurses at health facilities most often give oral rehydration (ORS) packets for diarrhoea. Furthermore, a behavior of not treating a child at all seems fundamentally different from giving treatment at home or taking a child away for treatment.

It seems instructive to examine the proportions of episodes of diarrhoea taken to different sources of treatment. We found that 19% of cases received no treatment at all, that 44% were treated at home only, that only 9% were treated away from home only, and that 28% received treatment at home and away from home. When classified in this way, the categories are mutually exclusive. This can be seen graphically in Figure 1 on the next page.

In addition, it is important to note that 72% of cases of recent diarrhoea were treated at home, that 37% were taken away from home for treatment, and that 28% of recent cases were taken to health care facilities (personnel) for treatment. Thus nearly three-fourths of all cases of diarrhoea were treated in the home while just over one-fourth of all cases were taken to health care facilities.

3.3 Home Treatments Chosen

Since about three-fourths of all recent cases were treated at home, what occurs in the home is clearly of great importance in the management of diarrhoeal disorders. Table 2 shows what treatments women mentioned when asked what they gave to the child in the home. These treatments were mentioned without any prompting. It was possible to cite more than one treatment for an episode of diarrhoea.

TABLE 2
TREATMENTS GIVEN AT HOME

	N	% of Cases Treated at Home N=206	% of All Recent Cases N=288
1) SSS	142	68%	49%
2) ORS	26	13%	9%
3) sorghum porridge ..	17	8%	6%
4) water	15	7%	5%
5) traditional med. ..	15	7%	5%
6) tea	4	2%	1%
7) other	42	20%	15%

The most striking aspect of this table is the overwhelming preference for SSS as a home treatment for diarrhoea. While one-half of all cases were given SSS, two-thirds of those treated at home were given SSS. In all, 160 out of the 206 (78%) cases treated at home were given either SSS or ORS, which seems like an impressive result. Also worth noting is the low percentage of other types of medicines given.

It is also possible to consider home treatments in the context of all treatments given to recent cases. Those figures are found in the column on the right. The table shows that 49% of recent cases were given SSS at home, and that 9% were given ORS packets. When we combine the proportions given SSS and ORS, taking into account that a few (8) were given both SSS and ORS (thus not counting them twice), we find that 56% of all recent cases were given SSS or ORS for diarrhoea. That constitutes a considerable increase from the 1987

survey results, when the figure was 37%. It also is higher than the percentages obtained in HEALTHCOM surveys in other countries.

3.4 Treatments at Health Facilities

A total of 107 (37%) women reported taking their child to a source outside the home for treatment. The large majority (77%) of those cases were taken to a nurse or a health care facility. In addition, 10 cases were taken to a family member or friend and 10 were taken to a traditional healer. Table 3 shows the different types of treatment received at health care facilities, first as a proportion of cases taken to health facilities (N=82), then as a proportion of all recent cases (N=288).

TABLE 3
TREATMENTS GIVEN AT MEDICAL FACILITIES

	N	% of Cases at Health Facil. N=82	% of All Recent Cases N=288
1) ORS	35	43%	12%
2) Kaolin	31	38%	11%
3) SSS	17	21%	6%
4) pills	7	9%	2%
5) syrups	6	7%	2%
6) other	22	27%	8%

As with home treatments, it was possible to mention more than one treatment for a case of diarrhoea. The combined total of cases receiving ORS and SSS at clinics was 52, or 63% of the cases brought to health care facilities, as seen in the left hand column in Table 3. The right hand column shows the figures as a proportion of all recent cases. Thus 18% (12 + 6) of all recent cases were given SSS or ORS at a health facility. In 1987 that figure was only 5%. It is also worth noting that the only other treatment given with any great frequency is kaolin.

In sum, when we combine the cases of diarrhoea treated at home with those taken to health facilities, and counting only once cases that received SSS or ORS both at home and at a clinic, we find that 199 cases (69%) received either SSS or ORS. This constitutes a clear

improvement over the results of the earlier survey, which found that 52% of recent cases received SSS or ORS at home or away.

3.5 Changes in Treatment Patterns

A comparison of the results of the surveys of 1987 and 1990 with respect to diarrhoea shows five main changes listed below.

- 1) there is an increase in the number of episodes of diarrhoea reported;
- 2) we find an important decrease in the number of cases that received no treatment at all;
- 3) the proportion of episodes treated at home increased;
- 4) the likelihood of a child receiving SSS or ORS when brought to a health facility increased sharply, while the chances of receiving pills or syrup decreased.
- 5) the overall proportion of children with diarrhoea who are given SSS or ORS at home or at a health facility increased substantially.

Table 4 summarizes most of these changes.

TABLE 4

TREATMENT PATTERNS FOR RECENT CASES: TWO SURVEYS

	<u>1987</u>	<u>1990</u>
Proportion with no Treatment	38%	19%
Proportion Treated at Home	53%	72%
Proportion Treated at Health Fac.	22%	28%
Proportion Given SSS or ORS	42%	69%
	N=186	N=288

The most significant change in behavior concerns the proportion of recent cases receiving SSS or ORS. How can this be explained? Four possible explanations could be suggested. First, since the more severe cases of diarrhoea, as perceived by the mother, are more

likely to receive SSS or ORS, perhaps there were more severe cases in 1990. In fact, 23% of cases were judged as severe in 1987 and 31% in 1990. That is not a large increase and by itself would not make a difference. However, in the 1990 survey, we found that the more severe cases were more likely to be given SSS or ORS in 1990. That did not seem to be the case in 1987. This suggests that a small amount of the increased proportion receiving SSS can be explained by the slight increase in perceived severity and the fact that more severe cases were more likely to receive SSS in 1990.

Two, since SSS and ORS were the most likely treatment given at home, perhaps the change can be explained by the increase in the proportion treated at all and in the proportion treated at home. That is certainly part of the answer, given the increase in home treatment and the decrease in no treatment.

Three, perhaps mothers treating diarrhoea at home learned that SSS and ORS were the best treatments and changed their behavior. There is not clear evidence to support that thesis. We should note, however, that the percentage of those cases receiving SSS or ORS when treated at home went from 70% to 78% only.

Four, perhaps nurses in health centres changed what they were giving for diarrhoea. Certainly part of the changes must be attributed to the changes in treatment given in health care facilities for diarrhoea in 1990. In 1987 only 5% of all recent cases received SSS or ORS at a health facility, while in 1990 the figure was 18%. If we look at only cases brought to health care facilities, we find that in 1987, 32% of those cases received SSS or ORS, while the figure for 1990 is 64%. It is also worth noting that at the same time, the proportion of those cases of diarrhoea receiving pills and syrups decreased by more than 50%.

4. KNOWLEDGE AND USE OF SSS AND ORS

4.1 Knowledge of SSS and ORS Packets

Our information about women's knowledge of SSS comes from survey questions asking if they had ever heard of SSS, if they knew how to prepare SSS, and what were the ingredients and quantities to use in mixing SSS. The questions about SSS and ORS were asked of the entire sample (N=1016). The Ministry of Health has been promoting the following recipe for mixing SSS: three soda cans or one litre of water, two pinches of salt, and two scoops of sugar. Table 5 shows the proportions of women with different levels of knowledge about SSS.

TABLE 5

KNOWLEDGE OF SSS AND ORS (N=1016)

1) % of women who ever heard of SSS	915	90%
2) % of women who knew correct effect of SSS	571	56%
3) % of women who said they knew how to mix SSS ...	765	75%
4) % of women who gave correct recipe of SSS	147	14%
5) % who gave approximate recipe for SSS	184	18%

While most women had heard of SSS and three-fourths said they knew how to prepare SSS, in fact, less than 20% of those interviewed were able to state the correct proportions of the ingredients as promoted by the Ministry of Health. A little less than half gave the right amount of water, and less than one-fifth gave correct amounts of sugar and salt. Most mistakes with the quantities of sugar and salt were from mentioning the wrong number of pinches and scoops. However, 120 women mentioned pinches (instead of scoops) of sugar and 44 mentioned scoops (instead of pinches) of salt.

Another way to consider this data is to ask what percentage of women prepared the SSS mixture with a concentration level of salt that might be toxic. Of the women who gave a recipe (N=741) for SSS, 8% gave a quantity of salt that was extremely high (2 teaspoons or 1 to 3 scoops/litre). Another 11% gave quantities classified as "other," that is, not what we were expecting. If we assume that one-half of the "other" quantities would lead to high salt concentrations, and we add 6% to our first total, we are left with about 14% of the recipes given contained very high levels of salt.

Still another way to consider knowledge of mixing SSS is to give individuals a score for correct quantities mentioned. In this case each person received one point for citing the right quantity of an ingredient. A person who gave the correct amounts for all three would get three points, and those with no correct amounts would receive a zero. Table 6 summarizes the distribution of this variable.

TABLE 6

IDENTIFYING CORRECT QUANTITIES FOR SSS MIXTURE

		<u>N</u>	<u>%</u>
None Correct	0	436	42%
One Correct	1	272	27%
Two Correct	2	148	15%
Three Correct	3	<u>160</u>	<u>16%</u>
		1016	100%

In a similar fashion, with the same group of people (N=1016), data about knowledge of ORS packets was obtained and the results are summarized in Table 7.

TABLE 7

KNOWLEDGE OF ORS

1) women who had ever seen a packet of ORS	531	52%
2) women who knew correct effect of ORS	301	30%
3) women who said they knew how to mix ORS	371	37%
4) women who gave correct quantity of water	322	32%
for mixing ORS packets		

We found a crucial difference in women's knowledge of how to mix SSS and how to mix ORS packets. Not only were there twice as many women who knew how to mix ORS packets correctly as knew how to mix SSS correctly. There was an even greater difference in the percentage of those who said they knew how to mix and those who actually gave the correct proportions. For SSS, 75% of all women said they knew how to mix but only 15% gave the exact proportions, while 37% said they knew how to mix ORS and 32% gave the right quantities. Otherwise stated, 20% of those who thought they knew about mixing SSS truly gave the right proportions, while the equivalent figure for ORS is 86%. This confirms what has often been noted, namely, that mixing ORS packets properly is easier than mixing the SSS mixture.

4.2 Use of SSS and ORS

One commonly finds two indicators used to report the use of SSS and ORS for diarrhoea: ever used and last case use. Although both will be mentioned for the sake of comparison, the last case use seems the more accurate of the two.

All women were asked if they had ever used SSS and if they had ever used ORS packets. Seventy-four percent reported having used SSS and 36% reported having used ORS packets at some point. The corresponding percentages from 1987 were 67% and 31%. Thus the ever use rate increased slightly.

The last case use rates increased in the second survey. Considering only recent cases, we found that in 1990, 69% of the cases were given SSS or ORS for diarrhoea. The corresponding figure for 1987 was 52%. This change constitutes a real improvement in how people respond to diarrhoeal disorders.

Among women who reported a recent cases of diarrhoea, 82% had used SSS before, and 49% used SSS for that recent case of diarrhoea. There was no statistical difference in the use of SSS for recent cases by urban and rural women. More analysis is needed on the data to understand more about why women choose to use SSS or ORS. We do know that women's perception of the severity of the episode is associated with the use of SSS ($p < .01$): while 35% of cases judged "not sick" were given SSS, 60% of those thought to be "very sick" were given SSS. Analysis is underway to examine other factors that may help explain the choice of using SSS or ORS for diarrhoea.

5. VACCINATION

5.1 Introduction

This discussion of vaccination coverage rates presents figures with reference to four different factors: 1) two age groups of children (12-23 and 12-59 months old); 2) rates of completion without regard for age as well as age appropriate completion rates; 3) rates from card (dated) evidence and from verbal reports; 4) completion rates over the past four years. Actual coverage rates vary somewhat according to how these factors are considered. Since so many survey results are reported for 12 to 23 month old children, this report focuses more on this age group than on others.

In our sample of 1016 households, we identified the youngest child in each household as the index child. Thus we have data from 1016 index children who range in age from one to 59 months. In that group of children, 393 were less than 12 months old, and there were 289 children 12 to 23 months old. Some of the immunisation results are reported for all index children, others are for children 12 to 59 months old, while still others concern 12 to 23 month old children.

All women (mothers or caretakers) interviewed were asked if their youngest child had a vaccination card. If she said yes, as did 89% of mothers and 84% of caretakers, she was asked to show the card. If the card was shown, the information about vaccinations (vaccines and dates) was copied onto the questionnaire. We call that evidence for calculating vaccination rates "card information." Certain coverage results are presented based upon card information.

If a woman was unable to show a vaccination card, she was asked if the child had received each vaccine, one by one, and the answer was recorded. We call those answers about vaccination status "verbal report." This report also present coverage rates based on verbal report. Evidence from cards always has a date with it, while verbal report evidence has no dates. Although less precise, some dating of the time of vaccination can be done with verbal report evidence, since the ages of the children are always given in months. However, most of our age appropriate figures will be drawn from cards only.

In the evaluation of an EPI programme, it seems important to determine the percentage of children 12 to 23 months of age who have completed the full series of immunisations, and that is shown as completion rates. Equally important are the rates of completion for each vaccine, and those rates are given. Finally, it seems important to estimate the proportion of children who received their

immunisations at the proper age and after the proper interval following the preceding immunisation. Those figures are found in the graphs that show age appropriate coverage.

With these various ways of examining coverage rates, which method of calculation provides figures that are the closest to what actually occurred? There is reason to believe that the verbal report data is closer to what occurred than the card data, and thus the actual coverage rates are close to what is given as verbal report. There are several reasons to believe this to be the case. First, the verbal report data closely follows the pattern of the card data; it differs only in being somewhat higher. Second, the rate of completion for those who show cards is about the same as those who do not have cards. Third, the verbal report figures fit far better with the overall trend over time as estimated by other surveys. And fourth, we know that card data is much lower than the reality, since so many women said they had cards but were unable to produce them at the interview.

The proportion of vaccination cards found in the survey for all index children (N=1016) was only 65%, which was much lower than the figures from some other surveys that have found cards at times in more than 90% of the households. The most obvious reasons for this difference lies in the fact that the survey interviewed both mothers and caretakers rather than just mothers, and the survey accepted mothers of children up to five years of age. If one takes only the group of mothers with children under two years of age, the survey found cards in 72% of the households, for mothers of younger children find cards more often than mothers of older children, and caretakers find fewer cards than do mothers. The rest of the difference may be due to differences in the way of asking for cards (insisting more) and differences in the way of choosing women to be interviewed.

5.2 Coverage Rates: Children 12 to 23 Months Old

5.21 Overall Coverage Rates

The rates of completion of vaccination for children 12 to 23 months old (N=289) was about 70%. In this age group, two-thirds (N=193) of the mothers or caretakers were able to show a vaccination card. If both verbal reports and card information are included, 73% (n=210) of them had completed all eight vaccinations, and 14% (n=41) had seven vaccinations. Figure 2 shows the proportions of this group of children that showed cards, and the proportions that were completely or partially vaccinated.

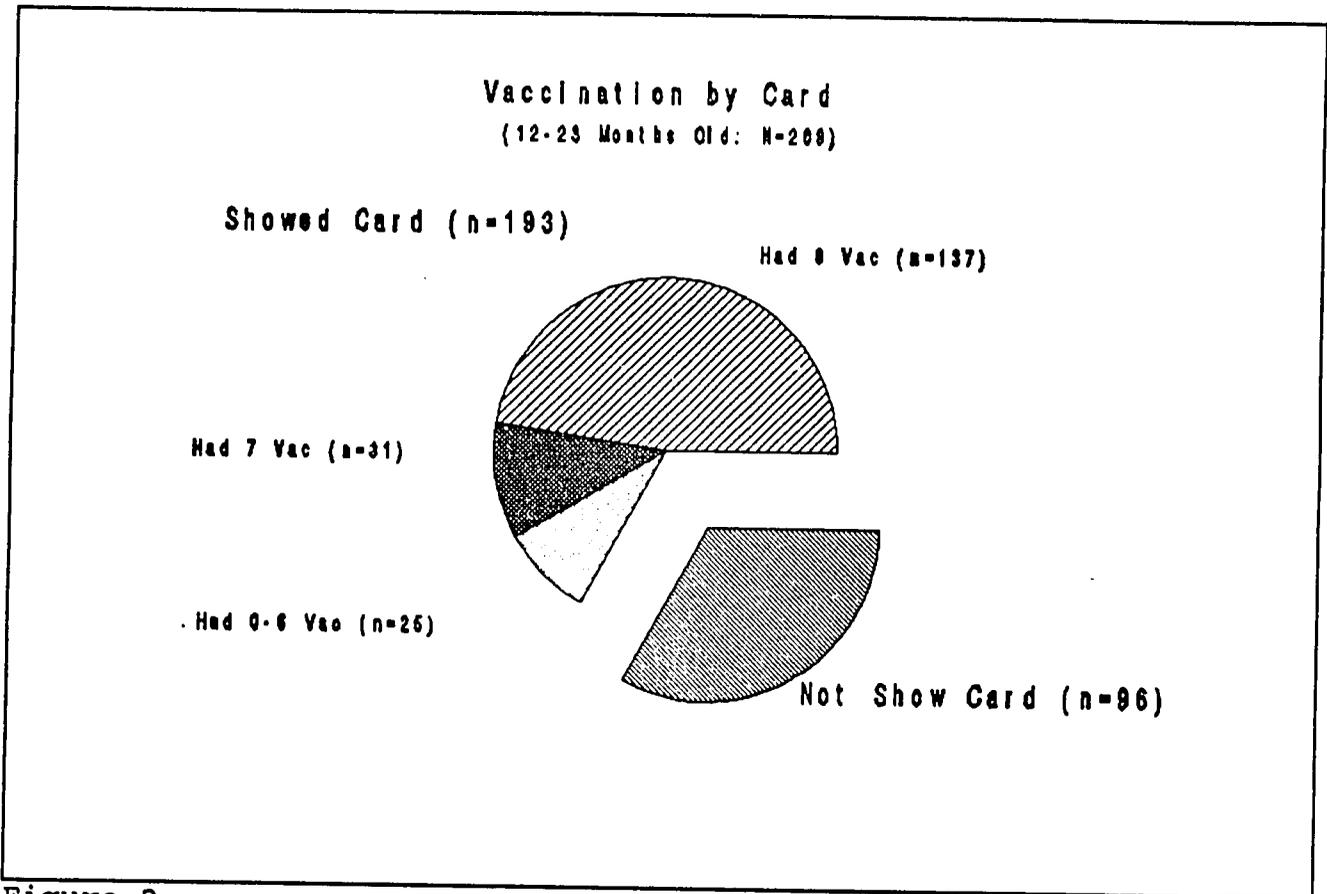


Figure 2

We can also consider coverage rates separately for children with and without cards. The completed coverage rate of the group with cards was 75%. That is, 75% of those who had cards had received all eight immunisations. Among children without cards (N=96), the completion rate was 70%. Thus we find virtually no difference in this case between coverage according to cards and verbal report.

5.22 Coverage Rates by Vaccine

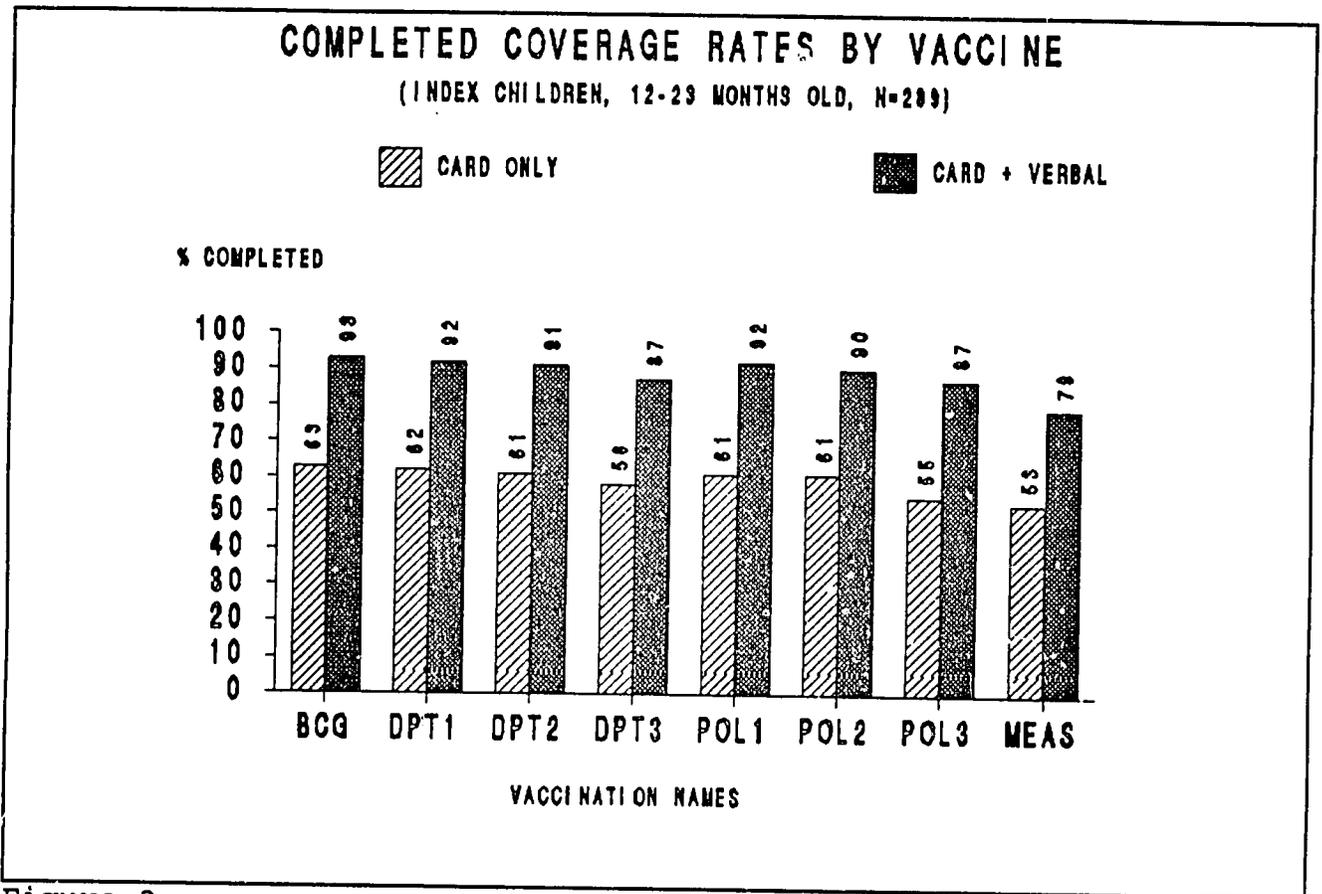


Figure 3

The coverage rates of each vaccination among children age 12 to 23 months is presented in Figure 3. Several aspects of this graph should be noted. First, coverage rates that combine card evidence with verbal report is from 25-30% higher than that of card evidence alone for all vaccines. Second, the pattern of coverage among vaccines is exactly the same for card as for verbal report. Third, BCG had the highest coverage while measles the lowest coverage. And fourth, the drop-off rate from DPT1 to DPT3 was from 4-6% for both card and verbal report evidence.

As mentioned earlier, the figures that most closely reflect actual coverage we believe were those based on verbal report. Perhaps some women, when asked if their child had a certain vaccination, said their child was vaccinated because they thought that was the right answer. Therefore, some allowance must be made--verbal report figures may be slightly inflated. Even if we say that inflation could be as

much as 5-10%, we still found very high coverage rates for this group of children, with measles above 70% and BCG near 90%.

The overall figures for coverage rates from this survey were very close to those of the November 1987 survey, whether we compare figures from card data or verbal report. While the figures for card coverage were slightly lower (3-5%), the differences lie well within the confidence intervals for the two surveys. The verbal report figures are slightly higher but statistically have not changed. Thus we conclude there was no statistical evidence for coverage change.

If we were to consider coverage rates for children with cards only, dropping children without cards from the denominator, rates would be far higher. With a denominator of children with cards and for the 12 to 23 months old group, coverage was above 90% for all vaccines except Polio 3 and measles, with BCG at 98% and measles at 84%.

5.23 Age Appropriate Coverage by Vaccine

Coverage rates calculated according to age appropriate criteria provide a reading on how many immunisations are given on time and how many are late (or early). In this report we have used two sets of criteria for calculating age appropriate vaccinations rates: one strict and one loose. The strict set has very short time periods for when immunisations should be given. The loose set has longer time periods for each immunisation. By comparing the figures from the two sets of criteria, one can easily see the proportion of immunisations that are given somewhat late for each vaccine. That comparison is shown by Figure 4.

The time periods of the two sets of criteria are:

Set A (Strict)

BCG = Within 2 weeks after birth
 DPT1, POL1 = 6-10 weeks after birth
 DPT2, POL2 = 10-14 weeks after birth
 DPT3, POL3 = 14-18 weeks after birth
 MEASLES = 9-12 months after birth

Set B (Loose)

BCG = Within a month after birth
 DPT1, POL1 = < 3 months after birth
 DPT2, POL2 = < 6 months after birth
 DPT3, POL3 = < 9 months after birth
 Measles = < 12 months after birth

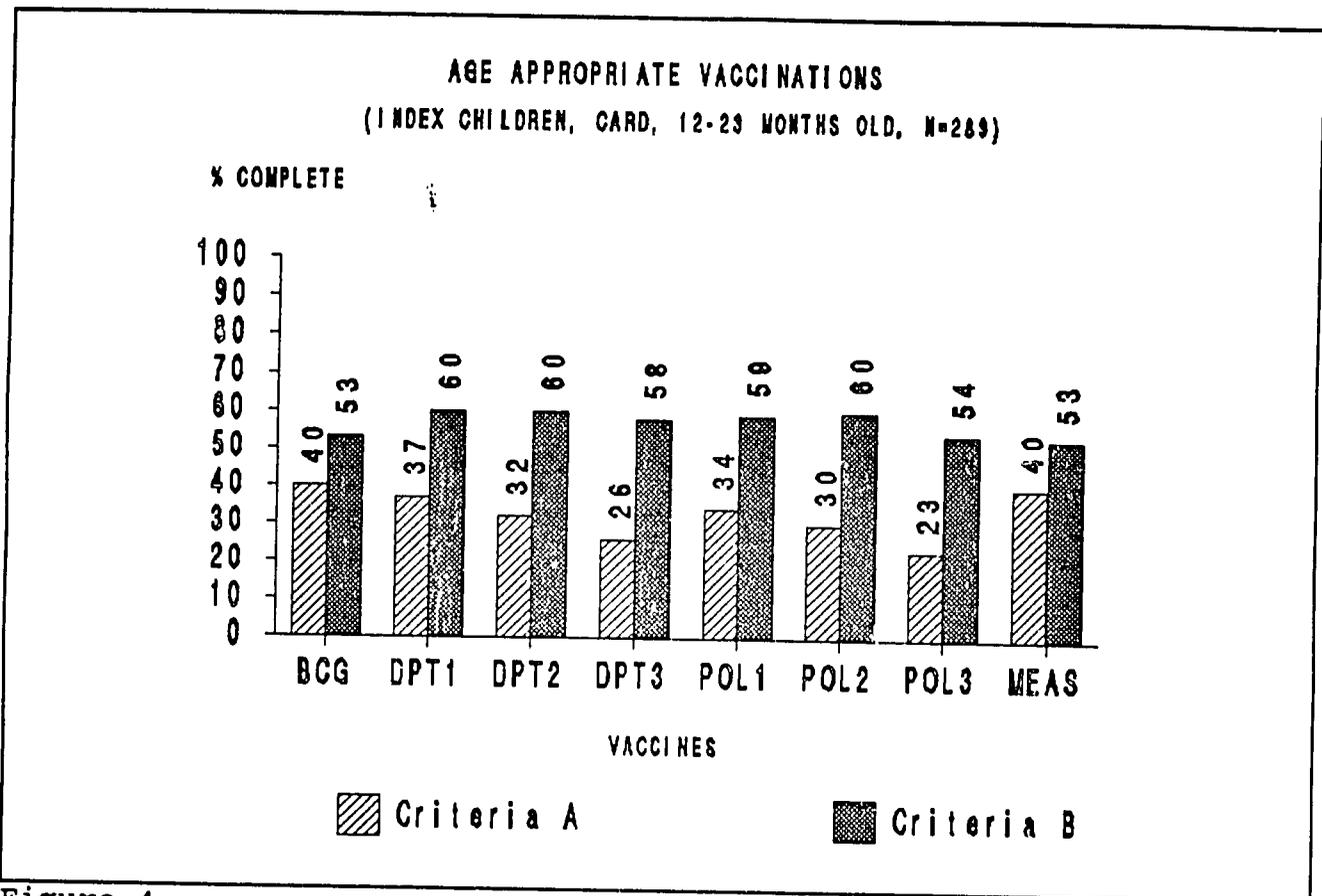


Figure 4

The completion rates according to these two sets of criteria are presented in Figure 4 above for children 12 to 23 months old, with the hatched bars being the strict set of criteria and the dotted bars the looser set. The graph shows, for instance, that 40% of BCG immunisations are given within two weeks of birth, and 58% are given within the first month of life. Since this information involves dates, this is based on card information only.

A comparison of the drop-off rates according to the two sets of criteria shows that while a sizable group of children were late in getting their DPT2 and DPT3 immunisations, almost all of those children were eventually immunized. This can be seen if we note that although coverage dropped from 37% for DPT1 to 26% for DPT3 for the first set of criteria, the drop-off was only from 60% to 58% for the second set of criteria.

The graph shows that among this group of children (12 to 23 months old), from 23% to 40% of them were immunized very near to the ideal date according to their age (BCG within two weeks, DPT1 within a month, etc.). It also shows that from 53-60% of these children were immunized from one to seven months after the ideal date.

5.3 Index Children: 12 to 59 Months Old

5.31 Completed Coverage Rates

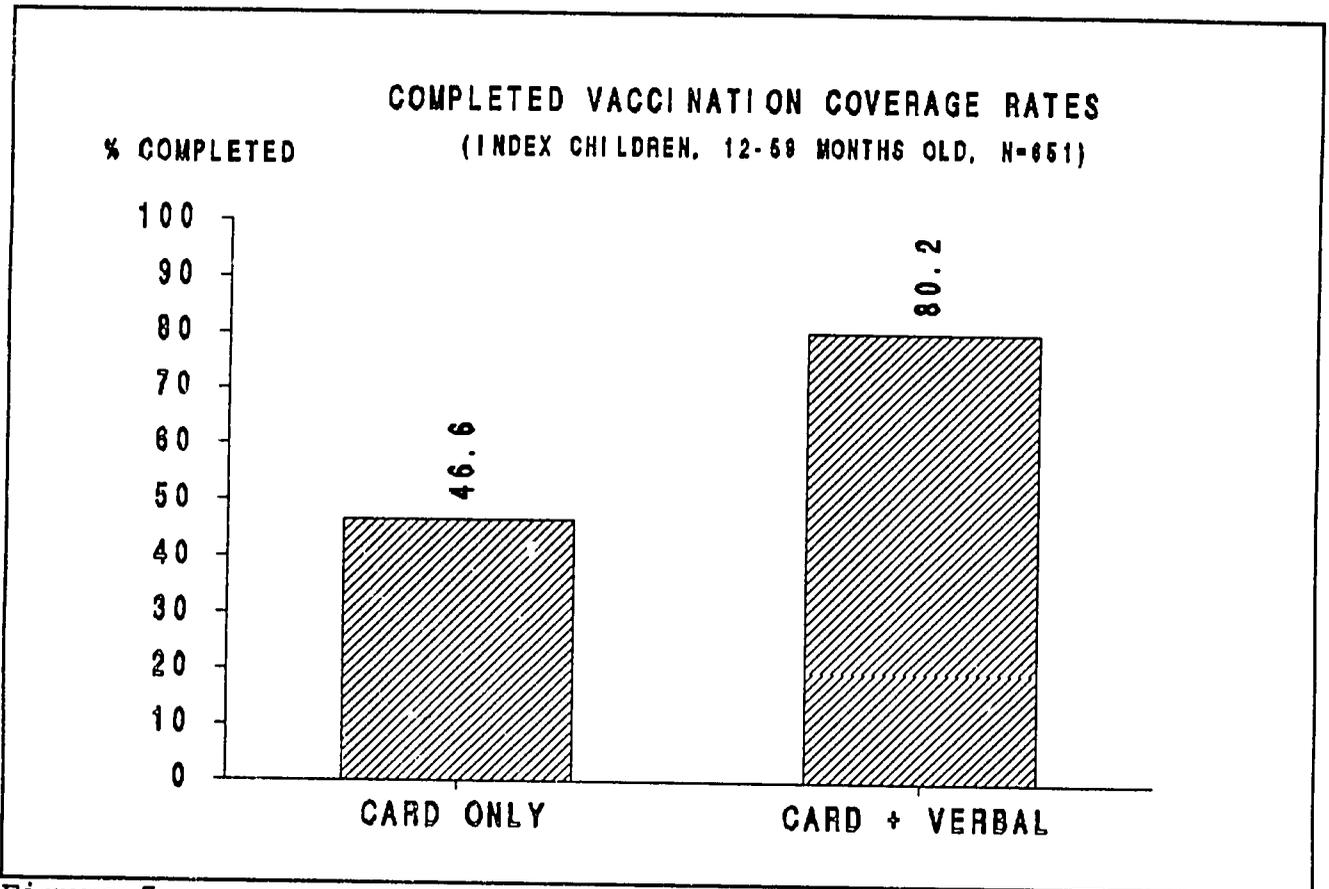


Figure 5

By the age of 12 months, children should have completed all eight immunisations. There were 651 cases of index children over 12 months old. We present two measures of completed coverage: one based on card information only, and one based on card information plus verbal report. Figure 5 shows the rate of vaccination completion for index children based on card information and on card plus verbal report. There was a small change from the 1987 survey figures, for the card information figure was 4% lower and the verbal report figure was 9% higher, but the two changes by themselves are not significant.

5.32 Coverage Rates by Vaccine

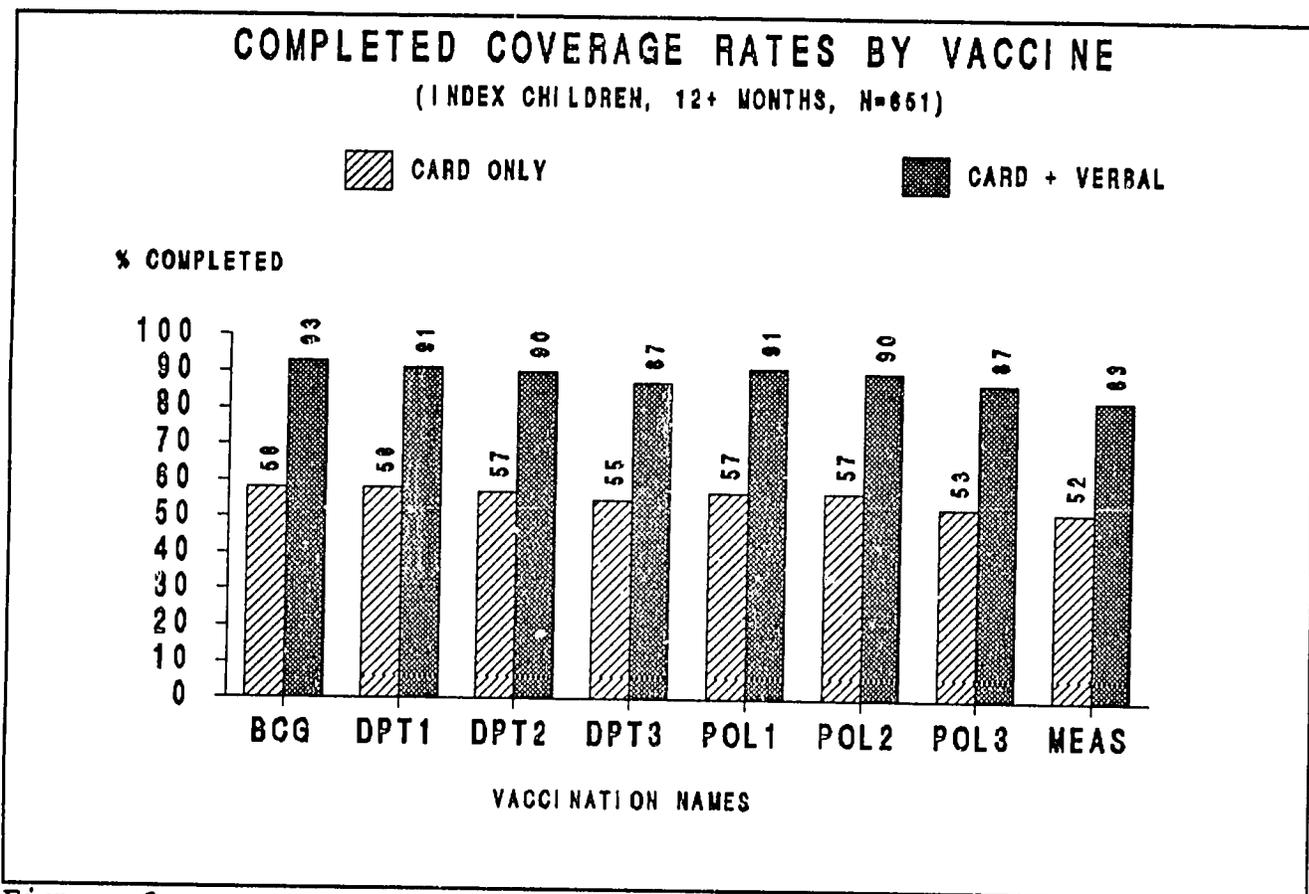


Figure 6

Coverage rates for each vaccine can be seen in Figure 6. The hatched bars show the percentages of children vaccinated based on cards only, while the darker, dotted bars show the rates obtained from combining card and verbal report. The highest coverage rate was for BCG, while the lowest rate was for measles.

According to the figures for card plus verbal report, there was a drop-off of only about 4% from DPT1 to DPT3 and for Polio 1 to Polio 3. The drop off pattern according to card information only follows exactly the same pattern and amount.

There was a difference of from 30-35% in the coverage rates according to whether one uses card information alone or card information plus verbal report. The difference in this age group was a bit larger than for the 12 to 23 month old group, since fewer cards were found for older children. The difference was about the same as the number of children that did not have cards (32%). While the card and verbal report information can be treated as lower and upper limits of

coverage, our experience leads us to believe that the "real" rate of vaccination is closer to verbal report than to cards.

5.4 Trends in Vaccination Coverage in the Past Four Years

5.41 Completion Rates at 12 Months of Age

We can obtain evidence of the performance of the vaccination process over the past four years by looking at the completion rates at 12 months. Since this involves immunisation at a certain age, only card data can be used.

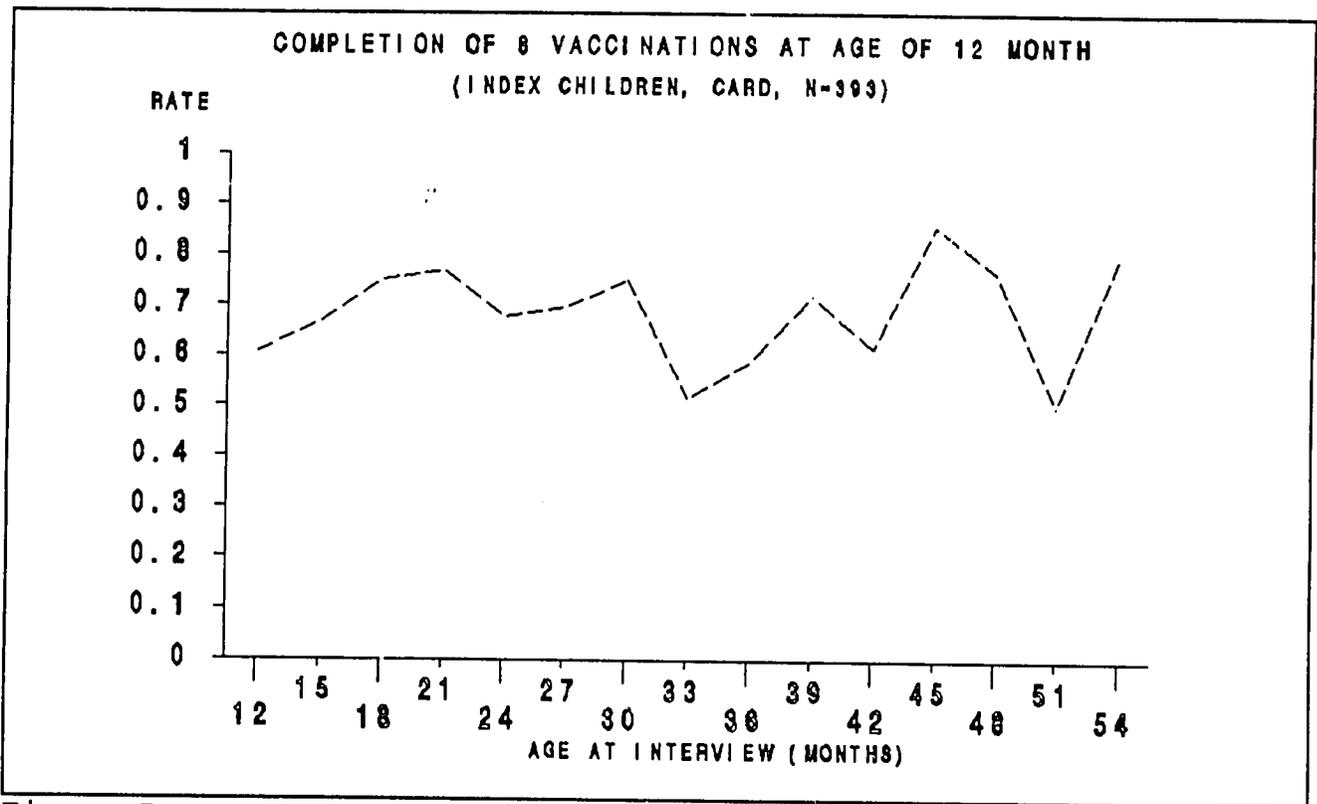


Figure 7

A back-dating programme was used to calculate coverage rates at the age of 12 months for all index children 12 months old and older (N=393) grouped by three month age groups. Figure 7 shows the proportions of 12 month old children who have completed their immunisation at 12 months of age. There are substantially more children for the younger age categories (less than 30 months) than for the older children. The graph suggests that the best performance was achieved in the period from 30 to 18 months before the survey.

Four years is the age limit for examining rates of completion, because our sample includes children up to the age of five, and we consider only children 12 months old and older in examining completion rates. Back-dating from cards provides us with rates of completion for different age groups as well as information about the timing of the immunisations given.

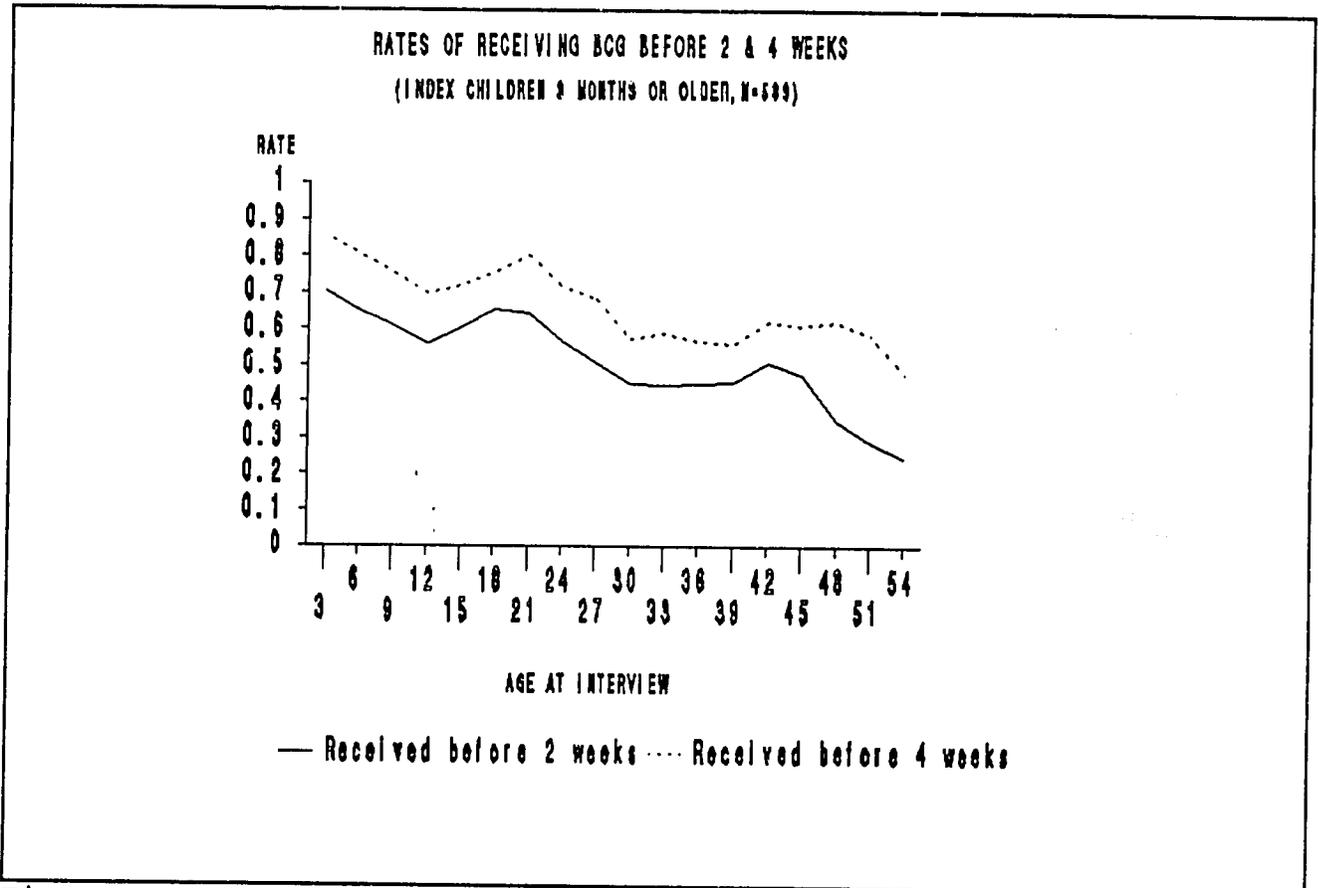


Figure 8

5.42 Timing of BCG and DPT1

Another question often asked is how the health system has been doing with regard to getting children immunized on time. Figure 8 shows the proportion of children who received BCG by two weeks of age and by one month of age over the past four years. There was a clear trend toward higher proportions getting BCG within two weeks and within one month during the past two and one-half years, and a striking improvement within the past year. Thus children born within the past year were more likely to receive BCG on time than those born earlier.

In a similar fashion, we examined the proportions of children who received DPT1 by the age of two months over the past four years. The

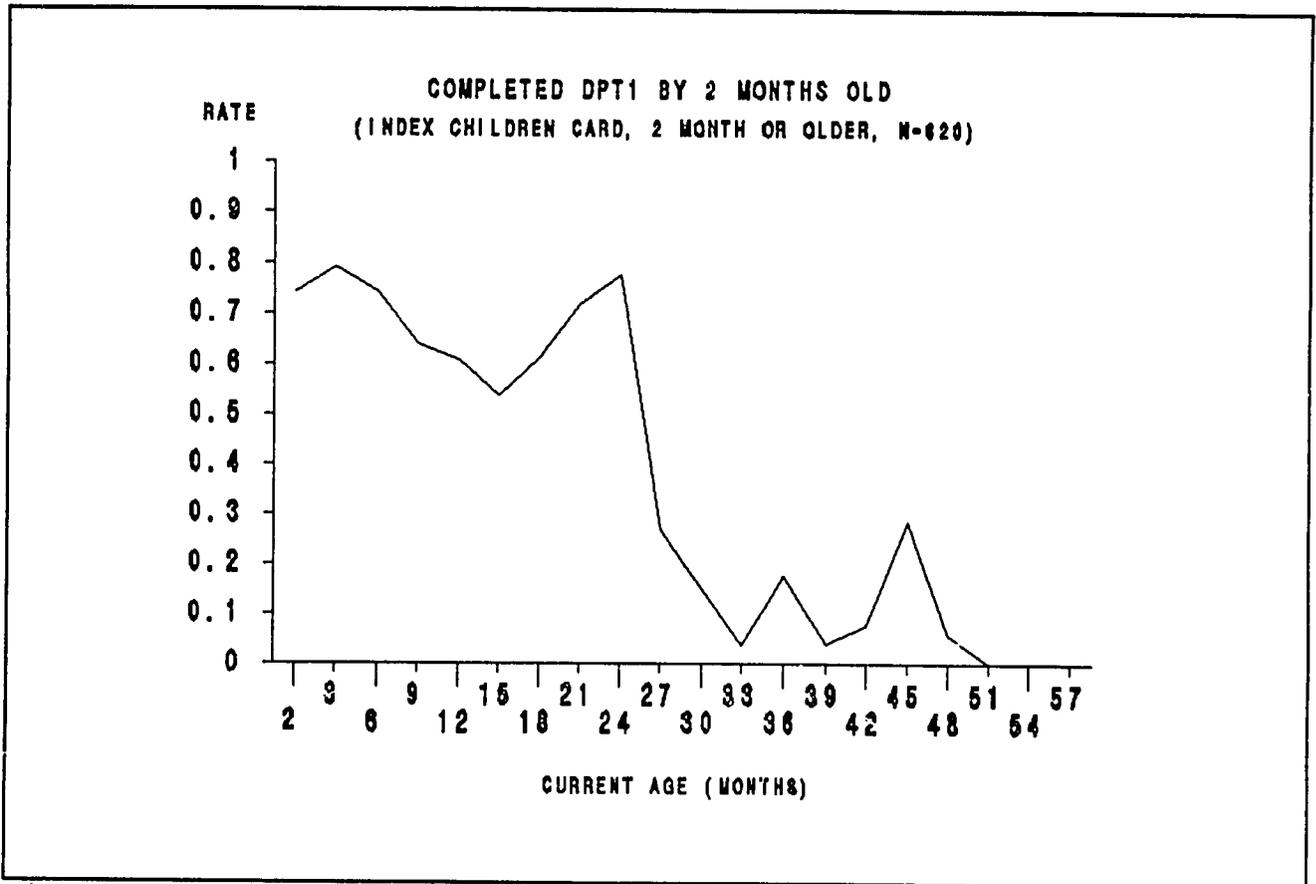


Figure 9

results are shown in Figure 9. The completion rate begins to rise steadily some two and one-half years ago for one year, and then dropped off before rising again. The graph clearly shows that the health system has improved in vaccinating children for DPT on time in the past year.

5.43 Intervals Between DPT1 and DPT2

We can get another look at the timing of immunisations by considering the number of days between DPT1 and DPT2 or DPT2 and DPT3. For DPT2 to be effective and be counted as valid, it must be given 28 days or more after DPT1. Figure 10 shows the proportions of children who received DPT2 at different intervals after DPT1 over the past four years. The dark area indicates the proportion of those who received DPT2 within four to six weeks after DPT1, which is considered excellent. The hatched area below the dark area shows the proportion of children who received DPT2 less than 28 days after DPT1. Thus in the period of time from 30 to 24 months before the survey, the proportion of children receiving DPT2 before 28 days dropped from 10% to near 0%. Since then the proportion has remained small, less than

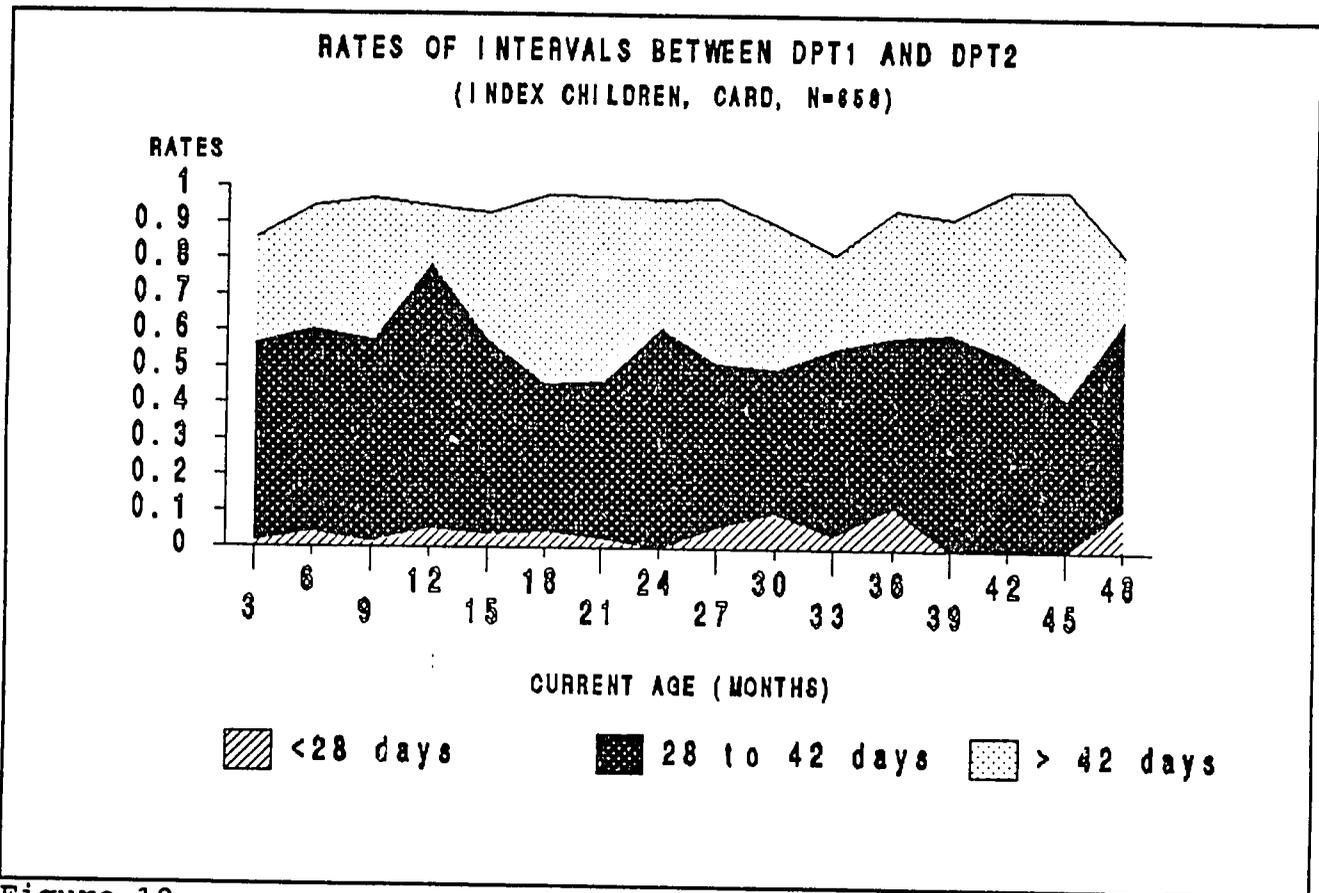


Figure 10

5% on the average. The hatched area above the dark area shows the proportion of children who received DPT2 more than two months after DPT1, and who thus were somewhat late in being immunised.

The proportion of children who received DPT3 less than 28 days after DPT2 has hovered around 10% for the past two and one-half years, with a slight dropping off about six months ago. That proportion reached its lowest point some 30 months ago.

5.5 Predictors of Vaccination Coverage

There is an ongoing interest in trying to understand why some women who bring their children for immunisations complete the entire series while others do not. If we could present a contrast between those two groups of women, and thus identify those who do not finish, the programme could better target that group for special attention. We found, for instance, that women with no education were less likely to have and show cards than those with some education.

This section discusses aspects of our search for predictor variables related to completion of vaccinations. It describes relations between vaccination coverage and some characteristics of the respondents. Since we are seeking relationships between rates of completion and other variables, we have included only mother and caretakers of children 12 months or older (N=651).

5.51 Education

Education is a significant predictor of completing vaccinations for certain groups. The main contrast we discovered was between mothers who had no education at all and those who had at least some education. Using evidence from verbal report, the completion rate was only 53% among mothers who had no schooling at all (n=36), while the overall average completion rate was 80%.

We also looked at the ability to read Sesotho as an indicator of education. Among women who could not read Sesotho (N=50), only 56% completed the eight vaccinations for their child, compared with the average rate of 80%.

5.52 Vaccination knowledge

A knowledge of vaccination scale was created by using the answers to five questions about knowledge. One point was given for each correct answer to the following items (answers unprompted):

- 1) What is vaccination for? (prevention of diseases);
- 2) What is the first vaccine given? (BCG);
- 3) At what age is BCG given? (at birth);
- 4) What is the last vaccine given? (measles);
- 5) At what age do children receive the measles vaccine? (9 months)

This knowledge scale is fairly reliable with an Alpha of .66 and Eigenvalue of 2.15 explaining 43% of the variance. There is a positive relation between respondents' knowledge and vaccination coverage of the children. Respondents scoring higher on the knowledge scale were more likely to have completed all the vaccinations. Those relationships are visually presented in Figure 11. Statistically, this relation is linear and $R=.25$ ($p<.001$).

5.53 Geographic Locations and Fees

It was thought that perhaps the location of household residence, such as urban vs. rural, mountain vs. lowland, etc., might be associated with different coverage rates, but no such relationships were found. In the same way, associations were sought between household possessions, which we used as a surrogate for financial resources,

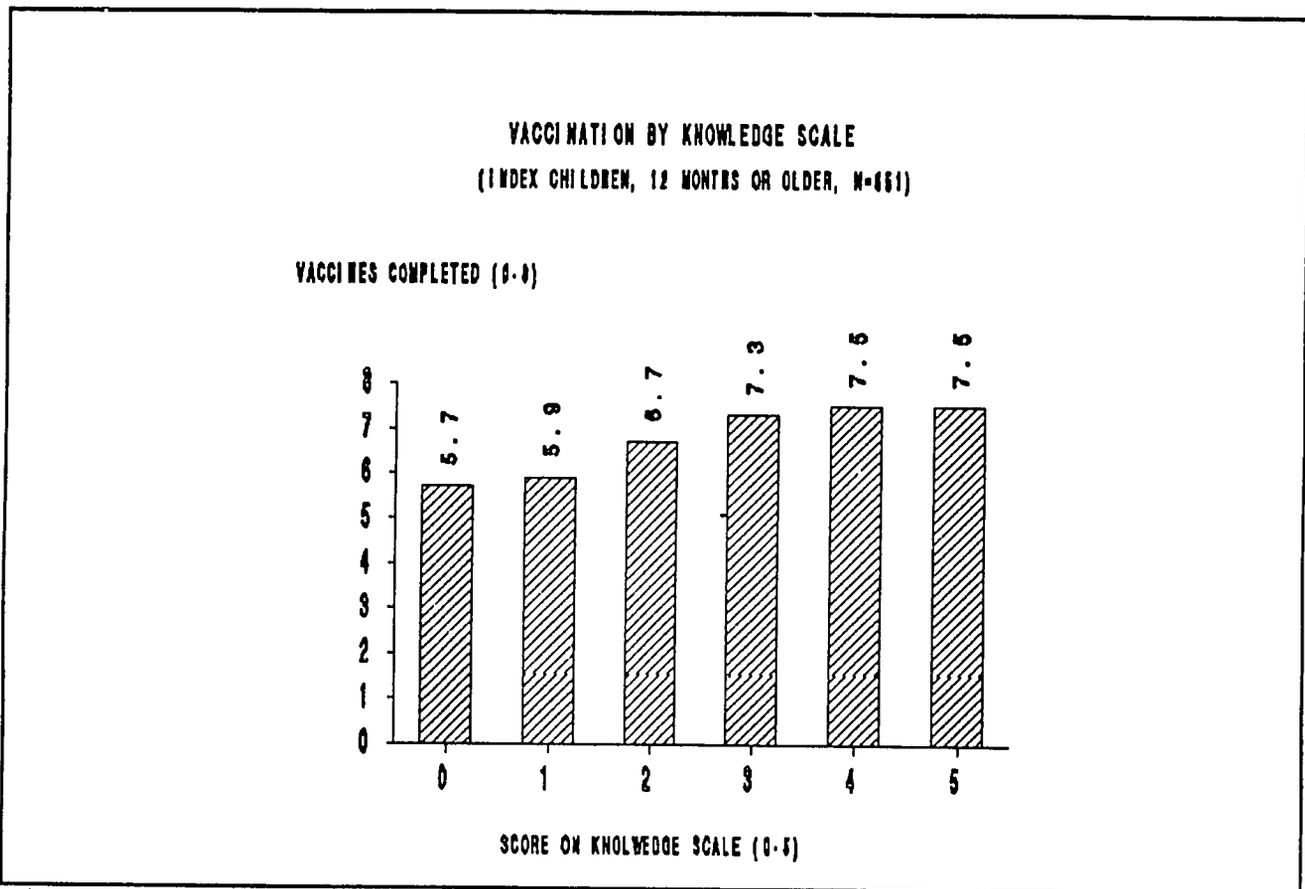


Figure 11

and variations in coverage rates. Though no such relationship was identified, it was found that women who had husbands working in South Africa were more likely to have their children completely vaccinated than other women. This contrast is most likely due to the fact that such women had a higher and more steady income than did most other women.

Women were asked about the price they paid for the most recent vaccination of their youngest child. More than 80% said the vaccination was free, and no relationship was found between completion rates and the reported cost.

6. RADIO LISTENERSHIP AND HEALTH PROGRAMMES

6.1 Overall Rates of listening

The potential audience for health programmes broadcast on the radio seems to be about 70-75% of women in Lesotho. A total of 69% of the women interviewed said they had a radio in their home. Those who said they did not have a radio (31%) were asked if they ever listen to the radio, and 101 (10% of 1016) said yes. That would suggest that 79% of the households listened to the radio. However, not all radios were in working order. In the 1987 survey, the percentage of those with a working radio was 13% less than the percentage of those who owned a radio. Thus the percentage of those who listen to their own radio at home is less than 69% (those owning a radio). We can say, however, that more than two-thirds of women listened to the radio.

The great majority (70%) of women who listened to the radio said they listened every day. In fact, 55% of all women said they listened every day; 10% said they listened from one to three days a week and only 2% listened from four to six days a week.

Radio ownership and listenership were not evenly distributed throughout the country. First, with respect to ownership, 83% of households in urban areas had radios, while that figure was 66% for rural areas. That difference is statistically significant ($p < .05$). Second, with respect to listenership, considering only the group of women who listened at all ($N=808$), the proportions of women who listened every day in that group differed according to geographic location. We found that 81% of urban women who listened at all, listened every day, while the corresponding figures for lowland areas was 71%, for foothills was 70%, but for mountains was only 55%.

6.2 Listening to Health Programmes

When asked if they had ever listened to a programme about the health of children, 396 (39%) women said yes. Those who said yes were then asked how long ago that was. We found that 18% of all women had listened to a health programme during the past week, 9% during the past month, and another 3% had listened from one to two months ago. Thus a total of 30% of the sample of women ($N=1016$) listened to a health programme within the past two months. If we consider only the group who listened to the radio ($N=808$), 42% of that group listened to a health programme during the past two months. Otherwise stated, less than half of those who listened to the radio heard a health programme in the two months before the interview.

Women who listened to health programmes ($N=396$) were asked about the name of that programme. While 30% of listeners identified the programme as Bophelo ba Rona, the name of the programme broadcast

from Tuesday through Saturday, 56% said they did not know the name of the programme they had heard. Another 12% gave a name other than one of the three listed in Table 8. The range and frequencies of responses to this question can be seen in Table 8.

TABLE 8

Programme Names Identified

	N	Total Sample	Heard Programme
Bophelo ba Rona	119	11.7%	30%
Rua Tsebo 'Me U Phele	3	.3%	1%
Botsa Ngaka (Ask the Dr)	9	.9%	2%
Other	46	4.5%	12%
Don't Know	222	21.9%	56%
		N=1016	N=396

The percentages of the right hand column show most clearly how large a proportion of people who listen to health programmes did not remember the names of the programmes. We see that the majority of women did not know the name of the health programme they sometimes listened to. Another indication of the same phenomenon is the fact that while 57 people said they listened on Monday morning, the only time that Botsa Ngaka is broadcast, only nine persons identified the health programme they heard as Botsa Ngaka.

A scale to measure health radio programme exposure was created with possible scores from zero to six. Persons who had no radio or did not listen to the radio received a zero, while those who recently heard a radio programme about diarrhoea or dehydration scored a six, with five variables in between. Points were given for having a radio, for listening, for ever having heard a health programme, for knowing the name of a health programme, and for having heard a programme about diarrhoea.

Using this scale, the difference between urban and rural areas was significant ($p < .005$). The same was true of differences between lowlands, foothills, mountains, and urban areas. We also found a positive relationship between the numbers of years in school and the score on the listening scale. Table 9 shows scores on the listening scale regrouped into two categories: those who received from 0 to 2 points, and those who received from three to six points.

TABLE 9

LISTENING BY GEOGRAPHIC AREA

	POINTS	
	0-2	3-6
URBAN	25%	75%
LOWLANDS	41%	59%
FOOTHILLS	45%	55%
MOUNTAINS	63%	37%

People were also asked about the main subjects that health programmes had discussed the last time they listened. Table 10 summarizes the responses to that question. The percentages given are the percentages of those who listened during the past two months. For example, the percentage for diarrhoea is 22%, which means that of the women who listened to a health programme in the past two months (N=396), 22% said the programme they had listened to concerned diarrhoea.

TABLE 10

SUBJECTS OF HEALTH PROGRAMMES

Diarrhoea	87	22%
Health in General	75	19%
AIDS	51	13%
Nutrition	36	9%
Personal Cleanliness	34	9%
Immunisation	21	5%
Dehydration	8	2%
Tuberculosis	8	2%
Other	59	15%
I don't know	124	31%

The table shows that the two most frequent subjects of radio programmes recalled by women were diarrhoea and health in general, followed by AIDS, nutrition, and personal cleanliness. No other subject was mentioned more than 5% of the time.

The table also shows that relatively few people reported listening to health programmes about subjects of most concern to the HED, particularly diarrhoea and AIDS, in the past two months. Considering the entire sample population, only 9% of the women reported having heard about diarrhoea on a health programme in the past two months, and only 5% had heard a programme on AIDS. If the HED is to have a good chance of having an impact on knowledge or practice, the percentages of persons reached must increase considerably.

Finally, persons who said they had listened to a programme about children's health were asked if they had heard any programmes about diarrhoea, dehydration, or ORT in the past month. Forty-two percent (168 of 396) of that group said yes. This question differs from the one asked earlier in that the earlier one was unprompted, while this one was prompted. When unprompted, 18% of listening women mentioned having heard a programme about diarrhoea or dehydration on the radio in the past month. That is, when asked about the subject of the health programme they heard recently, 18% spontaneously mentioned diarrhoea. For the latter question, the subjects were directly mentioned and the interviewees answered yes or no. The two percentages can be considered as upper and lower limits for the proportion of the audience that has recently heard about diarrhoea on the radio.

7. PERCEPTIONS OF PRINTED MATERIALS

7.1 Objectives

One section of the questionnaire contained questions about visual perceptions and about women's understanding of a pictorial brochure concerning diarrhoea. The brochure was developed and produced by the HED. This part of the survey had two main objectives. The first was to determine whether mothers recognized and understood the brochure used by nurses to teach women about the diarrhea and the mixing of SSS and ORS. The second objective was to determine which pictorial conventions seemed to pose the greatest problems for mothers. No matter how well designed or important the message, a brochure can have little impact if it uses pictorial conventions that most Basotho mothers are unable to decipher.

In order to evaluate the comprehension of the brochure, women were asked several questions about the brochure's topics and illustrations. Questions were also asked regarding factors thought to be related to comprehension of the pictorial material. It was hypothesized that previous exposure to the brochure would play a large part in mothers' understanding of the brochure. Those whom had been given the brochure and instructed in ORT in the clinics would seemingly have a better understanding of the brochure. But it was also hypothesized that even women who had not seen the brochure before would be able to understand most of it. Other factors that may determine comprehension were thought to be an individual's pictorial ability, level of education, past experience with pictures, and prior knowledge of oral rehydration therapy.

7.2 Comprehension of the Brochure

Comprehension of the brochure was determined by combining the mothers' answers to two questions into one variable. These two questions produced ten items which were used to create the variable "comprehension." All ten items produced a reliable and valid scale ($\alpha=.7774$, $\text{eigenvalue}=3.438$). The scores on the comprehension variable ranged from 0 to 10. The mean score was 5.59 (with standard deviation of 2.59). Fifty percent of the mothers got a score of at least 5.8.

Mothers were also asked to identify the main topics of the brochure and to describe a series of its pictures. Thirty-two percent of women were able to identify at least one of the three topics covered in the brochure, but only 7% identified all three topics. However, 41% of the women were able to describe all five of the illustrations asked about. These results indicate that while women understood the individual pictures of the brochure, they had difficulty understanding the overall message.

7.3 Factors Related to Comprehension of the Brochure

Exposure to the brochure was determined by asking mothers if they had ever seen the brochure before. Only 37% of the mothers surveyed claimed to have seen it before. However, it was found that there was a significant difference in the level of exposure to the brochure among different parts of the country. Forty-seven percent of mothers in the lowlands claimed to have seen the brochure, compared with 36% in the foothills, 33% in urban areas, and only 26% in mountain areas.

A pictorial ability test was administered in order to test mothers' ability to identify objects out of their normal context, to understand various pictorial conventions (such as depth cues and abstract lines conveying motion), and to interpret a set of pictures as one narrative. This test produced eight items which made a reliable and valid scale for pictorial ability ($\alpha=.6528$, $\text{eigenvalue}=2.823$). Scores ranged from 0 to 12 points, with a mean of 7.64 (standard deviation of 2.84). Fifty percent of the mothers got a score of at least 7.92. In other words, 50% of the mothers got at least two-thirds of the ability questions correct. Most women showed quite high pictorial ability on this test.

It was also hypothesized that mothers' level of exposure to other pictorial materials would have an effect on their level of comprehension of the brochure. Answers to a question asking about the last time the respondent had seen a picture in a book or magazine were used to determine level of previous exposure. Forty-one percent of the mothers had seen a picture in a book or magazine in the past week. Sixteen percent had never seen a picture in a book or magazine.

The final factor thought to be related to mothers' comprehension was familiarity with oral rehydration therapy in general. A mother's knowledge of how to correctly mix ORS or SSS would give her a background with which to interpret the pictures in the brochure. Thirty-two percent of all mothers knew how to correctly mix ORS, while sixteen percent of the mothers knew how to correctly mix SSS.

7.4 Variables Affecting Brochure Comprehension

We found a significant but weak relationship ($p<.0005$, $\text{gamma}=.2361$) between previous exposure to the brochure and comprehension of the brochure. Thirty-seven percent of the mothers who had seen the brochure before received a "high" score (8 or more points) on the comprehension scale, whereas only 24% of the mothers who hadn't seen the brochure received a "high" score. This indicates that while mothers who had seen the brochure before were slightly more likely to

understand the brochure, there seem to be other factors at work in determining an individual's comprehension.

It appears that pictorial ability also plays an important role in determining a mother's understanding of the brochure. It may be that whether she had seen the brochure or not she must know how to "read" pictorial materials in order to understand the brochure's message. There is a strong, positive, relationship ($p < .0005$, $\gamma = .4885$) between a mother's score on the pictorial abilities test and her score on the comprehension test. This indicates that a mother with higher pictorial ability will be able to better comprehend the brochure, and perhaps understand the brochure, even if she had not been "exposed" to the brochure before.

We also found a significant, positive relationship between mothers' comprehension of the brochure and their level of education ($p < .0005$, $\gamma = .2565$). Only 19% of mothers with less than four years of education received "high" scores, whereas 44% of mothers with more than seven years of education did. There was also a significant but weak positive relationship between comprehension of the brochure and last time the woman had seen a picture in a book or magazine ($p < .0005$, $\gamma = .1378$). Forty-five percent of those mothers who had never seen a picture in a book or magazine received a "low" comprehension score (0-4 points) and only 26% of those who had seen a picture in a magazine or book in the last week received such a low score. However, when controlling for level of pictorial ability, the positive relationships between comprehension and level of education and comprehension and past experience with pictures disappear except for those with "low" ability (0-4 points). In other words, for those with medium and high ability, education and past pictorial experience are only related to comprehension in that they partly predict ability. However, for "low" ability mothers, higher education or more pictorial experience will still have a positive effect on the level of comprehension.

Previous knowledge about the correct mixing of ORS or SSS was positively associated with comprehension of the brochure, though again the associations were somewhat weak. Thus 36% of the women who knew how to correctly mix ORS received "high" comprehension scores, whereas 26% of those who did not know how to mix ORS did ($p = .0004$, $\gamma = .2158$). Knowledge of the SSS mixture proved to have a slightly stronger relationship to comprehension of the brochure ($p < .0005$, $\gamma = .2861$). Forty-nine percent of the mothers who knew the correct amounts of all three ingredients in SSS received "high" comprehension scores, and only 22% of those who knew none of the correct amounts received "high" scores. It appears that mothers with correct knowledge about ORT were more likely to have a better understanding of the brochure, but, because the brochure is about other topics as

well, ORT knowledge was not enough to insure complete understanding of the brochure.

The results of this survey indicate that mothers' exposure to the brochure in clinics was not the only, or even the strongest, factor leading to comprehension of the brochure. It seems that individual ability was the most important factor leading to comprehension along with individual levels of education and past pictorial experience. Level of education and past pictorial experience were found to be of special importance to those with "low" pictorial ability. ORT knowledge is also important, though it is difficult to say whether exposure to the brochure led to increased ORT knowledge or whether previous knowledge simply aided in understanding the brochure.

Another way of seeing the effect of the brochure is to look at the relationship between exposure to the brochure and knowledge of what it was instructing -- how to prepare ORS and SSS. There was a significant, positive relationship between knowing how to mix ORS and having seen the brochure ($p < .0005$, $\gamma = .39103$) as well as between knowing how to mix SSS and having seen the brochure ($p = .0016$, $\gamma = .18518$). These relationships may indicate that nurses using the brochure have successfully taught some women to mix the solutions. It may also simply indicate that women who have better memories remember both the solutions and having seen the brochure in the clinics.

7.5 Pictorial Conventions

In order to use brochures with only pictures as effectively as possible it is important to know which pictorial conventions give mothers/caretakers the most difficulty. A number of past studies have examined the difficulties presented by pictorial conventions. Among those conventions examined have been the portrayal of objects out of scale to their true size, portrayal of objects isolated from their usual context, using different styles of illustration (i.e. simple outline or photographs), using pictorial cues to depict depth or movement, and telling a story through a series of pictures.

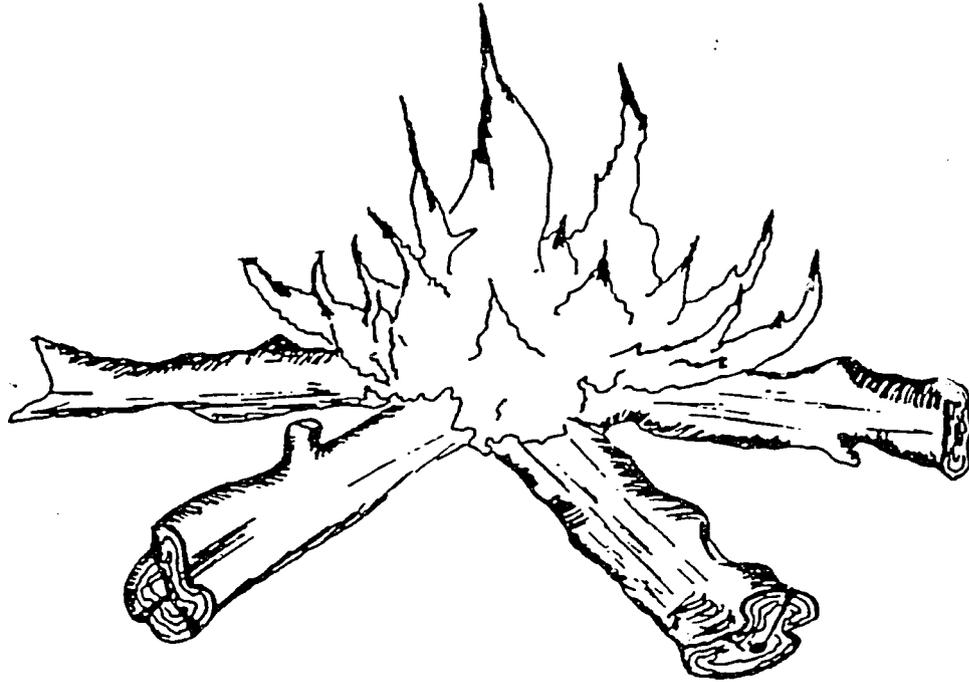
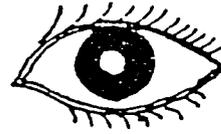
This project examined some of the conventions that have proven to pose the greatest problems for people with little pictorial experience. The survey results show that drawings out of context seemed to give few mothers problems: 87% of the mothers were able to identify an eye with no face (see Appendix A). This suggests that using hands unattached to a body, for instance, would not pose problems. However, conventionalized methods of using lines to illustrate movement (such as flickering flames) or background objects (such as mountains) did pose problems for a number of people. Only 51% could correctly identify the drawing of a fire and 66% correctly

identified a line as a mountain. Depth cues were also not well understood. Only 40% of the mothers thought that the larger house was closer to the man in the drawing where the scale indicated that the large house was the one closer to the man on horseback (see Appendix B).

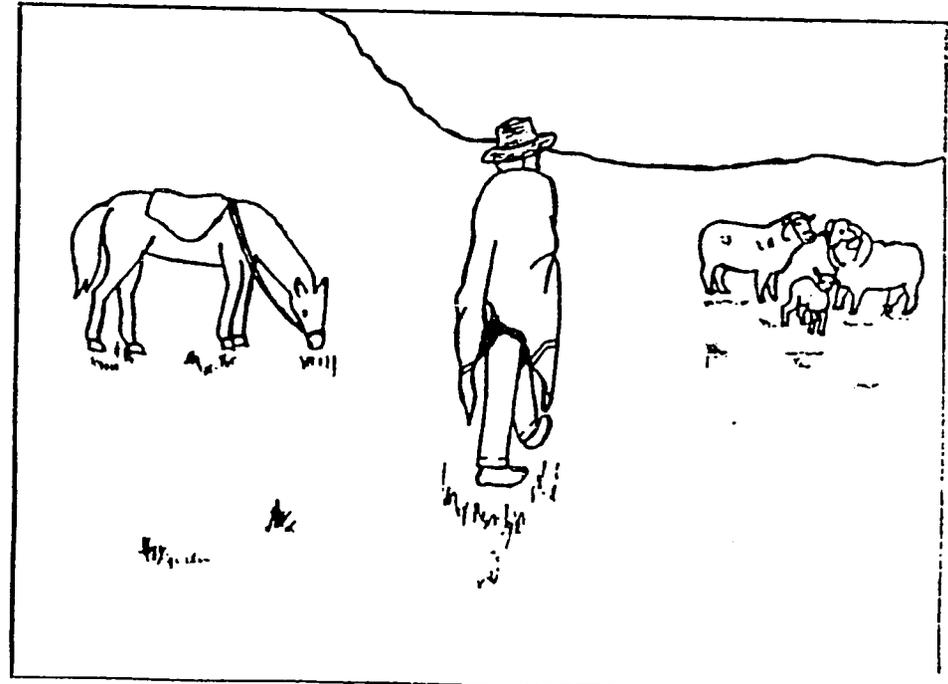
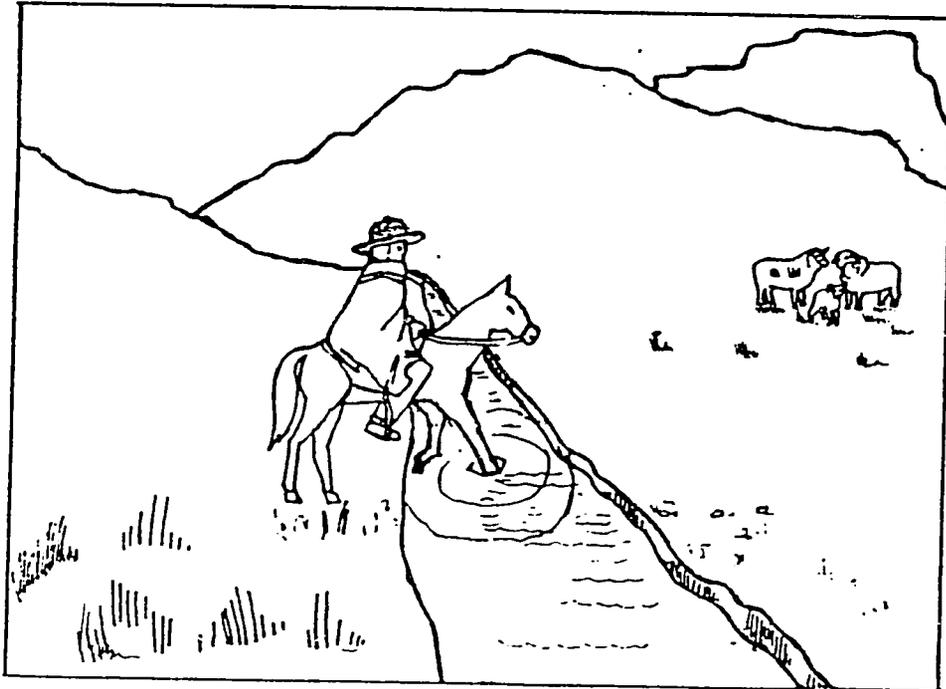
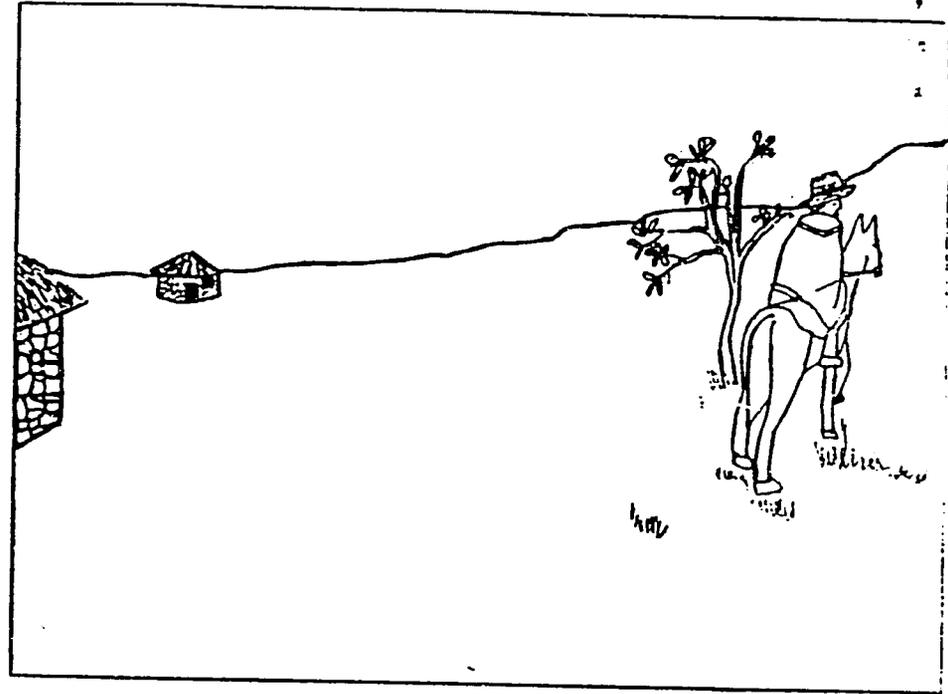
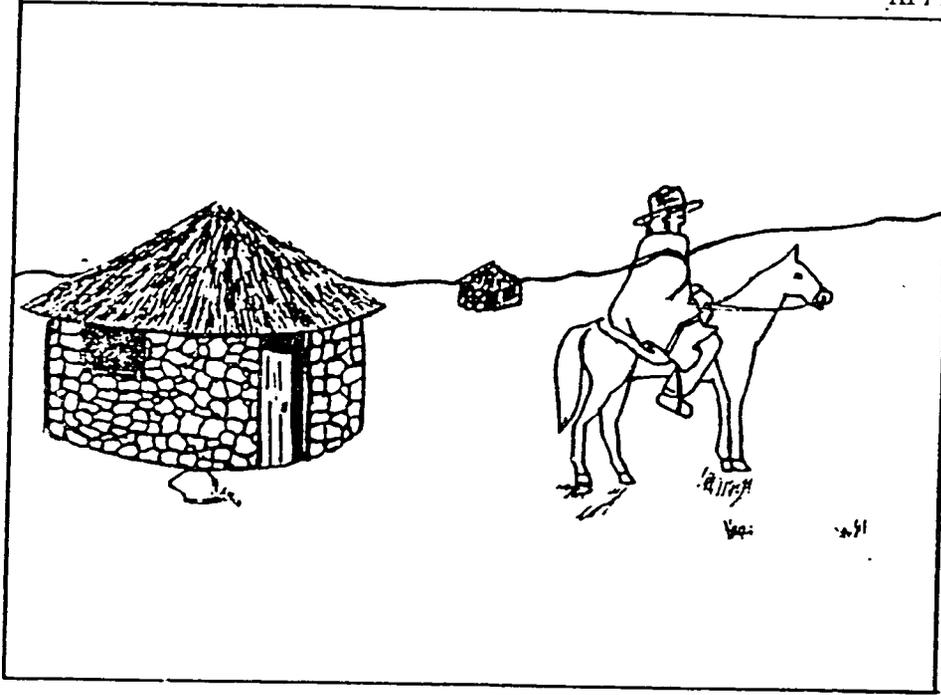
Beyond the conventions of drawing, conventions determining how we "read" or interpret pictures also posed problems for many of the mothers. Sixty-three percent described the series of four pictures in correct order -- left to right, top to bottom. Only 55% of the mothers were able to interpret the series of pictures as one narrative, discussing one man in four situations, instead of four men in four different situations. And only 42% of the mothers connected the first picture to the last picture and were able to say where the man in the first picture was going.

These results indicate that illustrations done for the majority of mothers in Lesotho should be rather simple in detail, not requiring an interpretation of depth or understanding of objects in motion. Most importantly, it appears that women may not be following the "narrative" of a series of pictures in the way one would expect. Instructions relying on a series of pictures should try to indicate that all the pictures are related and indicate in which order to read them (with arrows or numbers, for example).

APPENDIX A

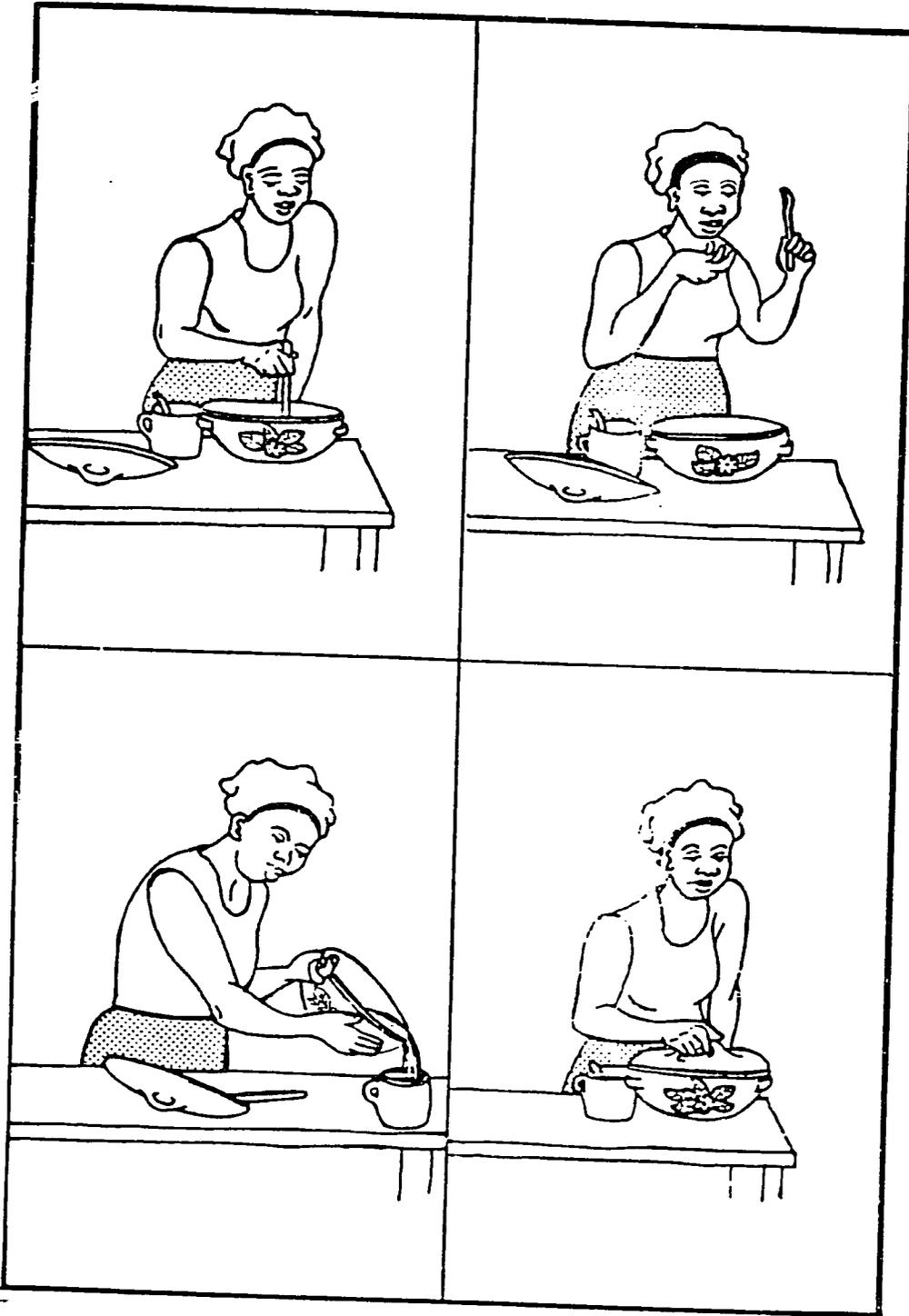


APPENDIX B



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APPENDIX C



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