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LEARNING AND FORGETTING FROM A
MULTI-MEDIA HEALTH CAMPAIGN:
PATTERNS OF ACQUISITION AND RETENTION
OF KNOWLEDGE AND BEHAVIOR
AMONG RURAL WOMEN
IN HONDURAS AND THE GAMBIA

prepared by

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Paper presented at the 36th Annual Conference of the International Communication Association, Health Communication Division, Chicago, Illinois, May 22-26, 1986.

The research reported here has been supported by the Office of Education and the Office of Health of the Bureau for Science and Technology, United States Agency for International Development. The data were collected under contract AID/DSPE-C-0028, with additional support from the USAID Missions in Honduras and The Gambia, the Ministry of Public Health in Honduras, and the Ministry of Health, Labour and Social Welfare in The Gambia. Data analysis was supported under a subcontract from the Academy for Educational Development under prime contract DPE-1018-C-00-5063-00.

Learning and Forgetting from a Multi-Media
Health Campaign: Patterns of Acquisition and
Retention of Knowledge and Behavior Among Rural Women
in Honduras and The Gambia

The single largest cause of death among young children in developing countries is diarrhea. In most cases it is not the diarrheal disease itself that kills the child, but dehydration from excessive loss of fluids. Dehydration can kill a child within hours.

A new low-cost technology has been developed that can prevent and treat diarrheal dehydration. This therapy is called oral rehydration therapy (ORT) and involves giving the child an oral rehydration solution made by mixing prepackaged salts or sugar and salt with water and giving it to the child orally. Other components of oral rehydration therapy are breastfeeding and other feeding practices.

This paper describes some of the results from two health communication projects in which one of the major objectives was to introduce an oral rehydration solution. These projects were funded by the U.S. Agency for International Development, implemented by the Academy for Educational Development, and evaluated by Stanford University and Applied Communication Technology. The two projects discussed here were pilot projects which took place in Honduras and The Gambia. This work has been expanded and the methodology will be applied in another 15 countries in the future.

The same overall approach was used in both Honduras and The Gambia, with modifications to fit the different contexts. Both projects involved extensive pre-program research using methods from social marketing. Both projects used multiple media--radio, interpersonal channels, and print materials--in an integrated way

to get across the same messages. In both countries, the intervention lasted two years with cycles of messages. Messages about oral rehydration were emphasized in several cycles over the two years.

The primary questions we examined were: What was the pattern of learning and remembering how to mix ORS and what was the pattern of first using and continuing to use ORS for cases of diarrhea? The results will be presented first for The Gambia, then for Honduras.

Results from The Gambia

The Gambian government chose to introduce an oral rehydration solution made from the family's own supply of sugar and salt. This solution was called water-sugar-salt solution (WSS). One of the major educational tasks in The Gambia was to teach mothers how to make WSS using the correct proportions of water, sugar, and salt. The measuring units recommended were locally-available soda bottles and bottle caps.

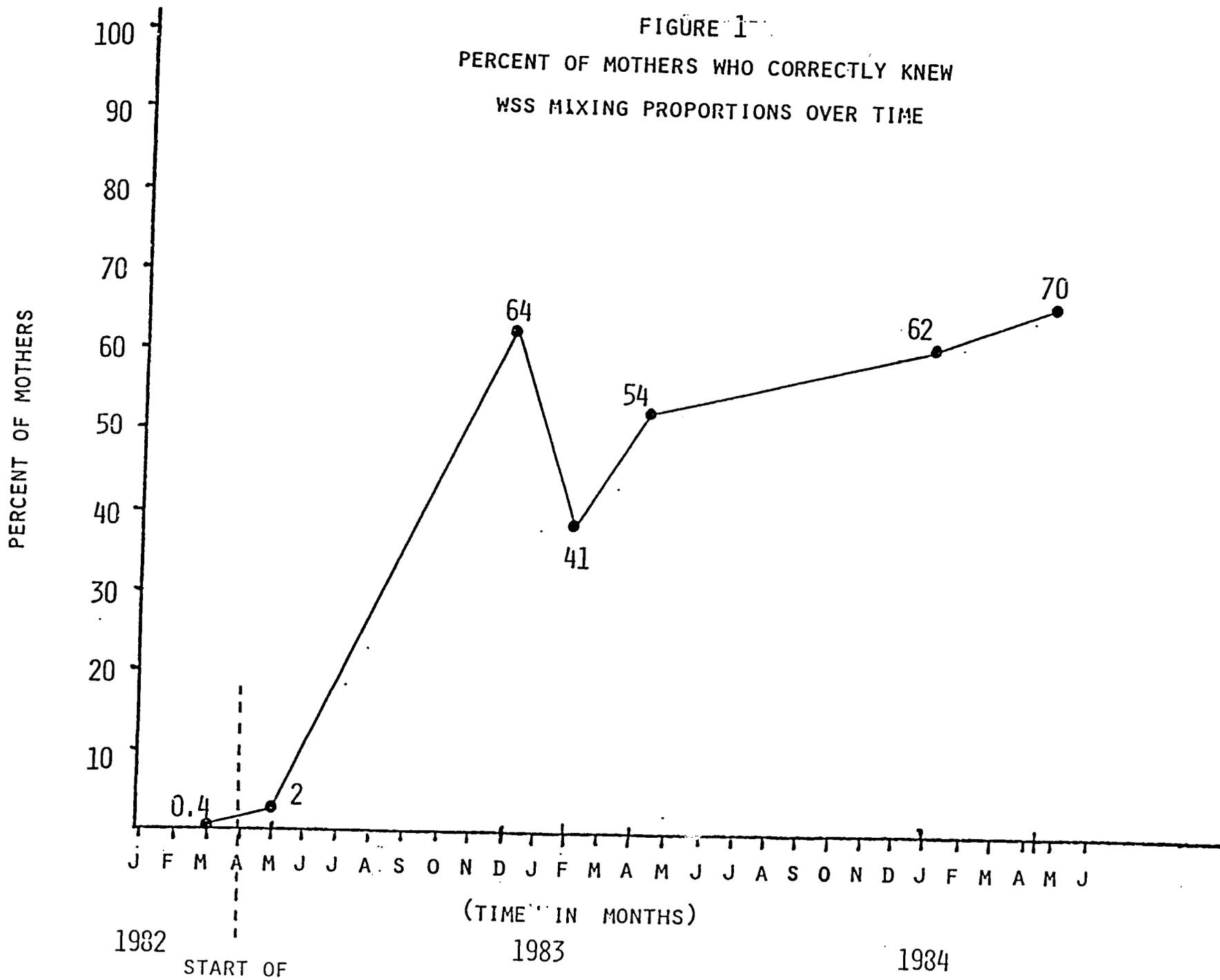
The outcomes examined in The Gambia were: the pattern of mother's first knowledge of the correct mixing proportions, maintenance of this knowledge, the pattern of first use for the last case of diarrhea and continued use.

WSS Mixing Knowledge

Did Gambian mothers learn to correctly mix WSS?

Figure 1 shows that, over time, there was a steady increase in the percentage of mothers who knew the correct formula for making WSS. We see a steep rise in knowledge after the start of the intervention and during the first phase of messages focussing on WSS, a drop shortly after, and then a steady climb during the later parts of the campaign. It is important to note that

FIGURE 1
PERCENT OF MOTHERS WHO CORRECTLY KNEW
WSS MIXING PROPORTIONS OVER TIME



learning about WSS was not taking place only in the first year; there was also learning during the second year.

We looked at this more closely by examining cumulative learning about WSS over time and also forgetting over time. Figure 2 illustrates these results. The top line shows the percent of mothers who could ever recite the correct mixing instructions. Again, we see a steep first-learning curve at the beginning of the intervention. However we also see that the campaign was picking up new learners in the second year of the intervention. By the end of the intervention, 85 percent of the mothers had known the correct formula at least one time during the two years. This indicates that the intervention in The Gambia had very extensive reach.

As one would expect, we also find forgetting of the WSS formula, represented by the bottom line in the figure, which shows the percent of mothers who didn't know the formula at least once. The pattern of forgetting is such that approximately half of those who learned the formula forgot it at some point. This suggested a problem in maintenance of correct mixing knowledge over time. Therefore, we examined the issue of knowledge maintenance more closely.

To study maintenance of knowledge over time we only looked at mothers who knew correct mixing at least once and then examined their subsequent knowledge. Did mothers who learned once remember correct mixing in subsequent interviews? Figure 3 presents these results, looking at the total percentage of mothers who knew the formula at any one point after they first learned and the percentage of mothers who knew the correct formula every time after they first learned.

Of the mothers who had known correct mixing once, 60 percent knew how to correctly mix the solution the next time they were asked (one wave after initial learning). If we look at the bottom line on the graph, we can see the proportion of mothers who maintained correct knowledge each and every time after they

FIGURE 2
 CUMULATIVE PERCENT OF MOTHERS WHO HAVE LEARNED
 AND FORGOTTEN WSS MIXING OVER TIME

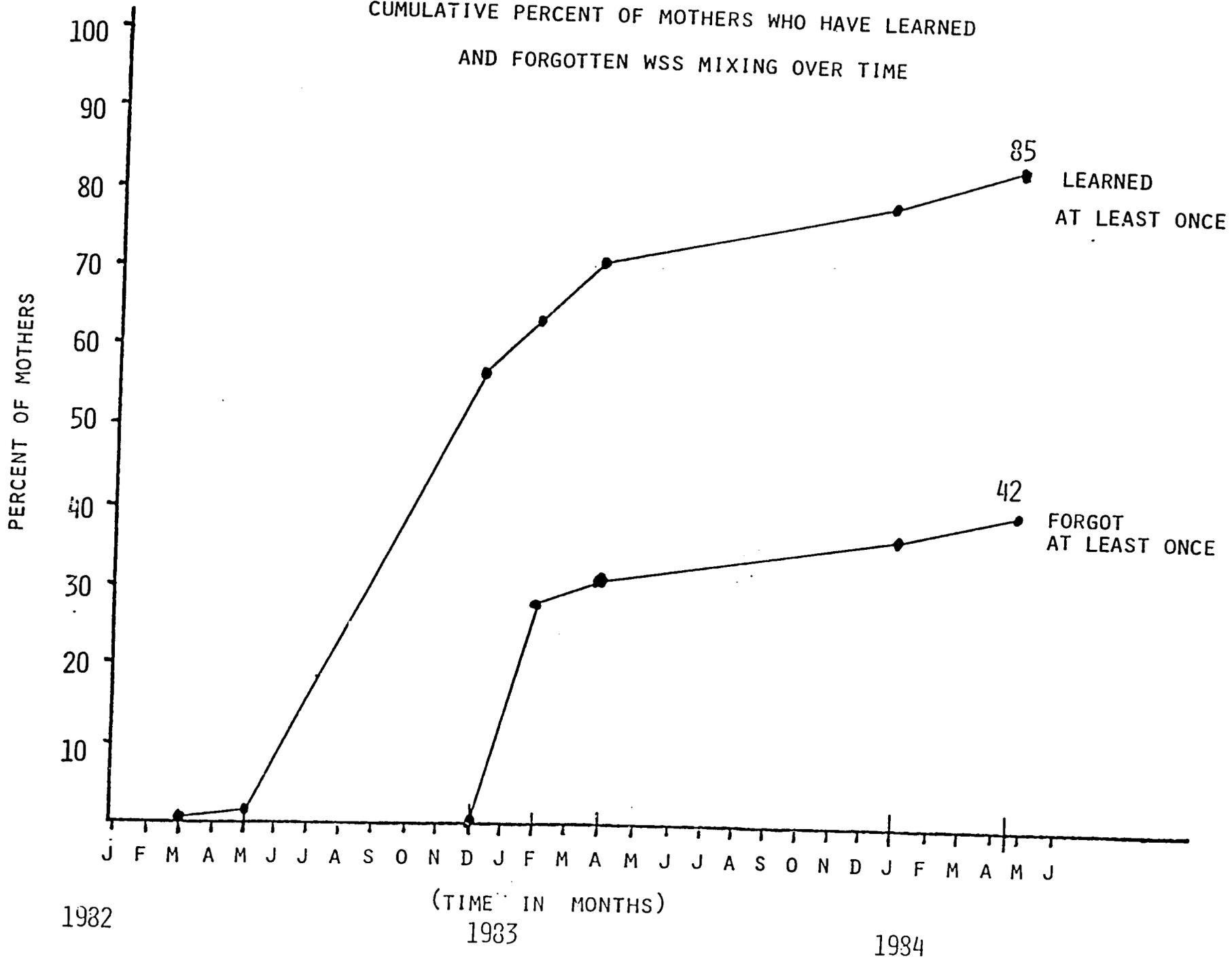
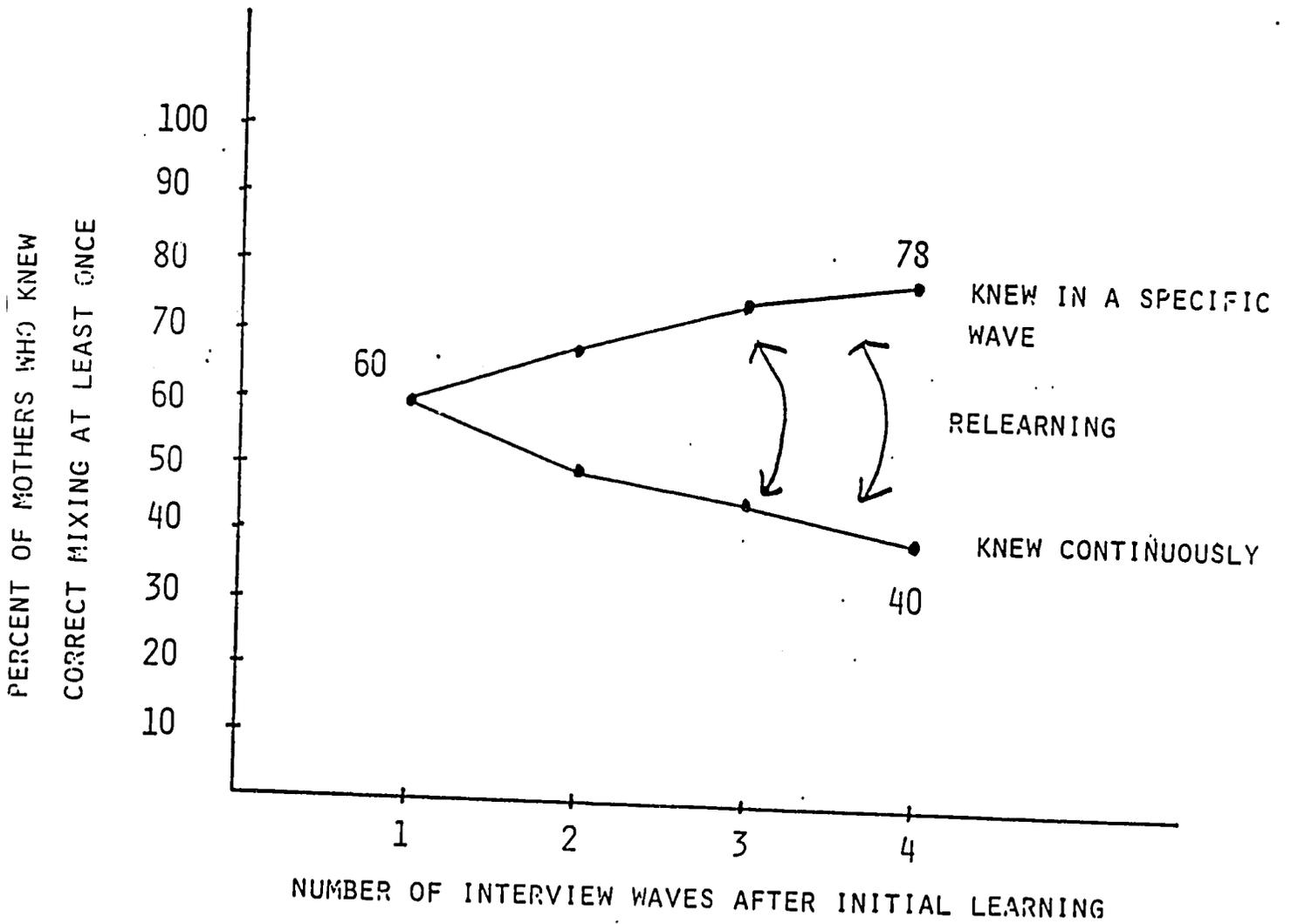


FIGURE 3
MAINTENANCE OF WSS MIXING KNOWLEDGE
AFTER INITIAL LEARNING



first learned, a strict measure of maintenance. Continuous correct knowledge dropped over time. Forty percent of mothers maintained correct mixing knowledge throughout the entire intervention.

However, we can also see that at any one time, more and more mothers knew correct mixing. The top line in the figure shows the percentage of mothers who knew in any given wave after they first learned the correct formula. For example, 78 percent of the mothers knew how to correctly mix WSS in the fourth interview wave after they first learned. Thus, although only 40 percent of the mothers had continuously known correct mixing by the fourth wave, a much higher proportion actually knew at this time point. This indicates that mothers were forgetting the formula over time, but then relearning it at some point (the gap between the two lines is an indication of relearning). This suggests that a continual level of information is needed over a long period of time to maintain mothers' knowledge of correct mixing.

Use of WSS

We then examined the same patterns for use of WSS. Use of WSS was measured by asking mothers how they had treated the last case of diarrhea in one of their children. Overall we saw the same patterns as for WSS knowledge.

Figure 4 shows the distribution of mothers reporting use of WSS for a case over time. We see a steep climb in reported use in the first year, but also that mothers were still adopting WSS in the second year of the intervention.

To examine WSS use more closely, we looked at the cumulative percentages of mothers who ever reported using WSS for a case during the intervention. Figure 5 shows a steep rise in use in the first year, but also continued trial during the second year. By the end of the intervention, 88 percent of the mothers reported using WSS at least once, a very high level of trial.

However, as with knowledge, we saw that mothers were also

FIGURE 4
 PERCENT OF MOTHERS WHO USED WSS OVER TIME

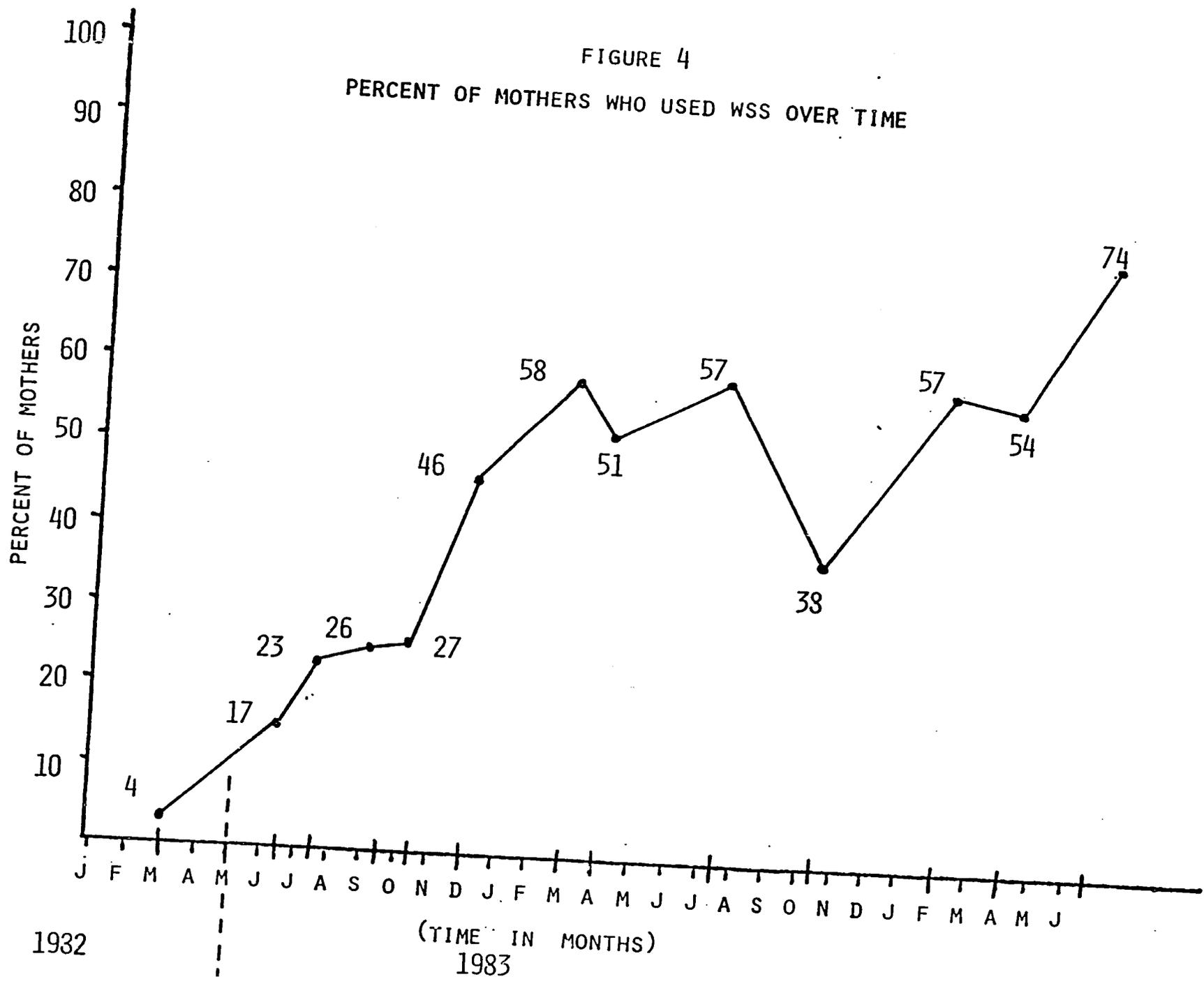
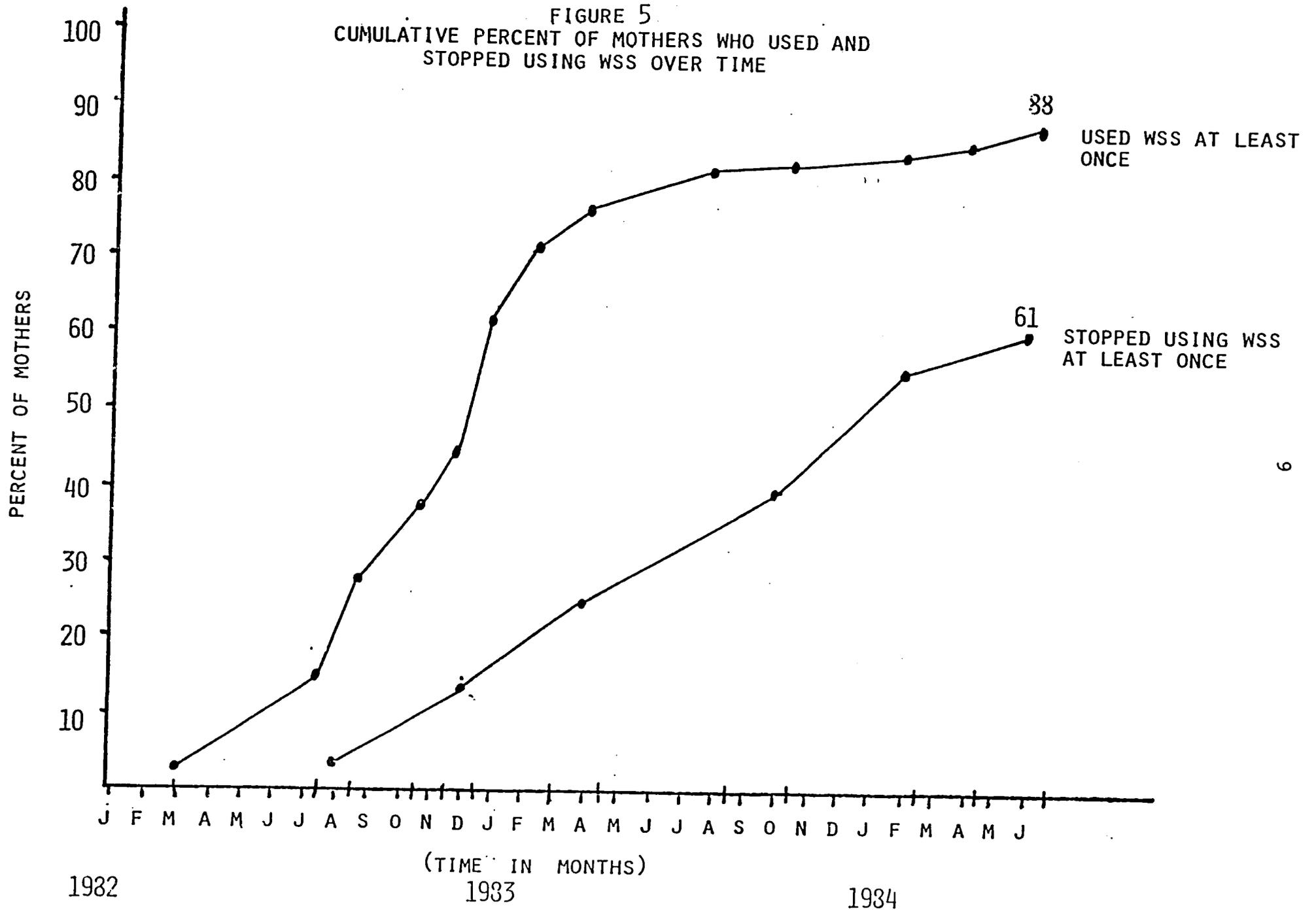


FIGURE 5
 CUMULATIVE PERCENT OF MOTHERS WHO USED AND
 STOPPED USING WSS OVER TIME



stopping use of WSS during the campaign. By the end of the two-year intervention, 61 percent of the mothers had stopped using WSS at least once. This suggested possible problems with maintenance of behavior and led us to examine the pattern of behavior maintenance over time in more detail.

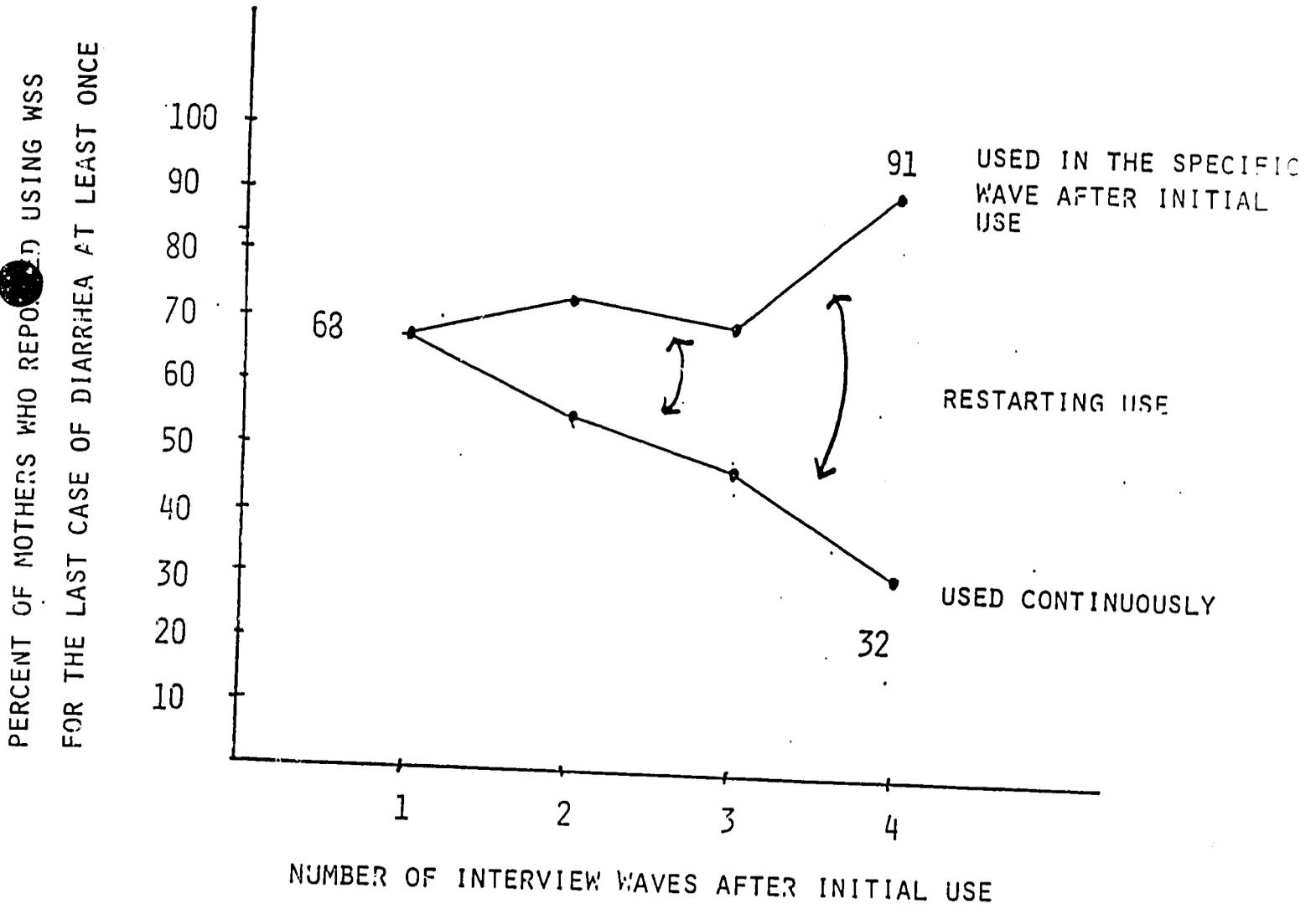
We looked at mothers who reported using WSS at least once. After initial use, did mothers continue to use WSS for subsequent episodes of diarrhea? Figure 6 presents the results of these analyses.

The bottom line in the figure represents mothers who, after first using WSS, continuously reported using WSS in all the following interview waves. We see that approximately 56 percent of mothers maintained WSS over three questionnaire waves, 47 percent over four waves, and 32 percent continuously used WSS over five interview waves. Overall, we find a continual rate of stopping WSS use for a case of diarrhea.

However, we can also see that at each interview point, a high percentage of mothers were reporting WSS use (as represented by the top line in the figure). This indicates that Gambian mothers were stopping use, but then restarting. The gap in the two lines in the figure represents those mothers who stopped use some time during the intervention but then started using WSS again.

Overall, in The Gambia, we find a very high level of WSS learning and adoption in the first year, which leveled off but continued in the second year. We also see that mothers learned, forgot and relearned and started WSS use, stopped, then started again. These two findings suggest that a campaign of this length (2 years) was necessary to obtain the overall high rates of WSS knowledge and use seen in The Gambia.

FIGURE 6
MAINTENANCE OF WSS USE AFTER INITIAL USE



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Results from Honduras

The Honduran government chose to introduce a packet-based oral rehydration solution that was named "Litrosol." Instead of measuring out her own sugar and salt, the mother empties a packet of sugar, salt, and electrolytes into a liter of water and gives this mixture to her child. Only the results of analyses on Litrosol use will be presented here.

Use of Litrosol was examined in a different way than WSS use because behavior was measured differently in the two countries. In the Honduran interviews, if a mother reported a case of diarrhea in the six months prior to the interview, she was then asked how she had treated it. Thus "Litrosol use" was reported use of Litrosol for a case in the last six months. Mothers who reported no cases of diarrhea during the entire two years never had an opportunity to use Litrosol. Therefore, they were eliminated from the calculations.

Our first question in the analysis was, Did mothers try Litrosol and use it for cases of diarrhea? Figure 7 shows an overall increase in the percent of mothers who reported using Litrosol over the course of the intervention. As in The Gambia, we see a steep rise in use in the first year, but also continued adopting in the second year. In the final interview, 47 percent of mothers with a case in the past six months reported treating with Litrosol.

We then asked, Did mothers who tried Litrosol once continue to use it for subsequent cases of diarrhea or did they stop? To examine this, we looked at mothers who reported a case in the first year and examined what they did in the following 1 1/2 years. Of the mothers who reported a case in the first year, 142 (or 29 percent) said that they had treated the case with Litrosol.

Figure 8 shows later Litrosol use for both first year users (top line) and nonusers (bottom line). We see that a high proportion (from 41 to 61 percent) of mothers who adopted

FIGURE 7
 PERCENT OF MOTHERS OVER TIME WHO USED LITROSOL
 FOR A CASE IN THE LAST SIX MONTHS

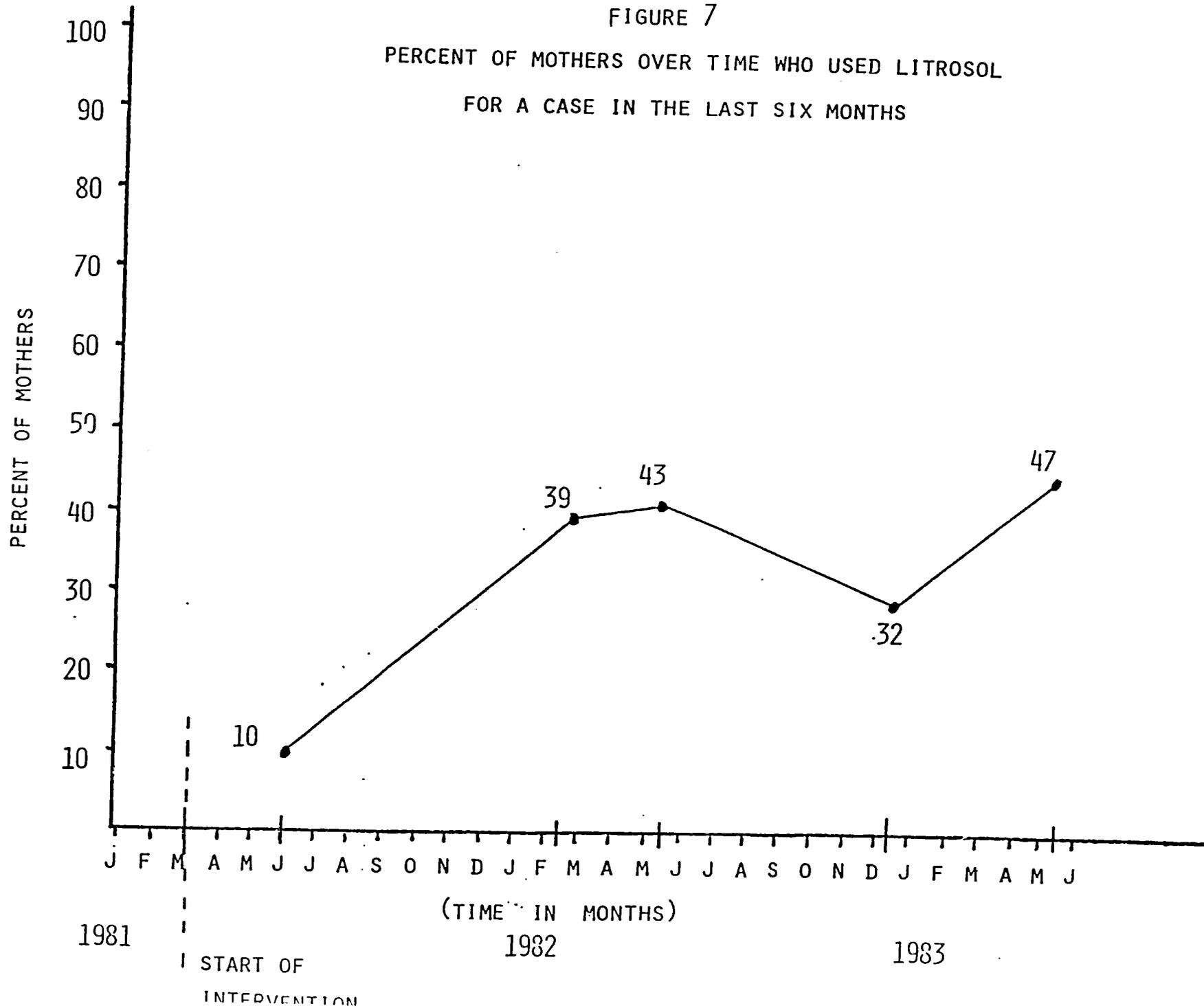
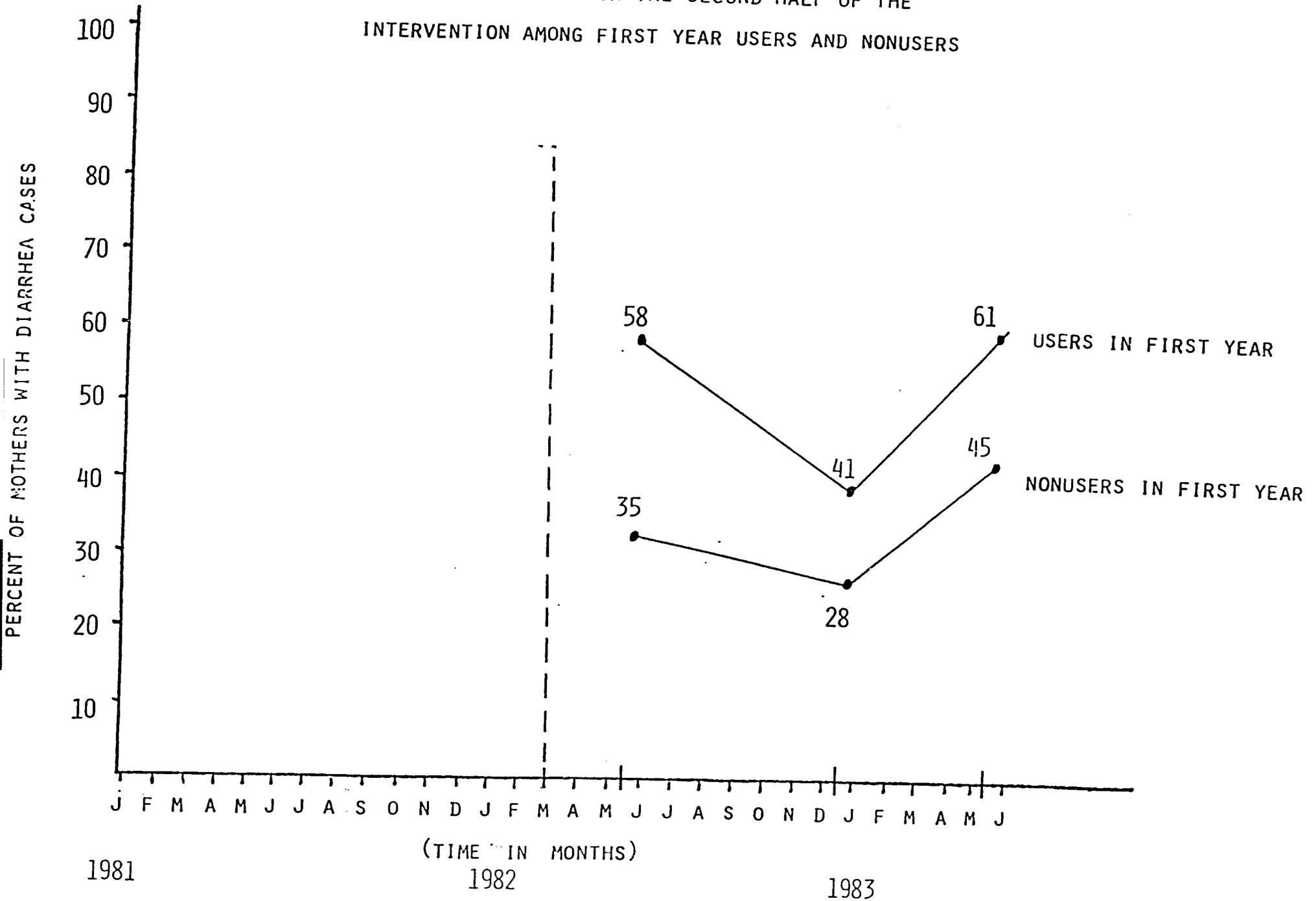


FIGURE 3
 USE OF LITROSOL IN THE SECOND HALF OF THE
 INTERVENTION AMONG FIRST YEAR USERS AND NONUSERS



Litrosol early in the intervention continued to use it for subsequent cases (as reported in May-June 1982, December-January 1983, and May-June 1983). However, we also see new adoption of Litrosol by mothers who had not reported using it in the first year of the intervention. From 28 to 48 percent of nonusers reported use in the second year.

When we look at the cumulative figures for Litrosol use after the first year we see that:

69 percent of users in the first year used Litrosol at least one more time in the later part of the intervention, and

46 percent of mothers who did not use Litrosol in the first year did start to use Litrosol in the second part of the intervention.

Our final question asked, Did mothers who tried Litrosol in the first year use it for the majority of subsequent cases? For these analyses we looked only at first-year users who reported two or three diarrhea cases in the second part of the intervention. We found that 36 percent of mothers who used Litrosol in the first year, used it for the majority of cases in the later part of the campaign.

As in The Gambia, we see that there were mothers who maintained Litrosol use over time after first adopting it. We also find that mothers started and stopped use over time (suggested by the pattern seen in Figure 8), although this can't be seen as clearly as it was in the Gambian analyses. We also see new adoption later in the intervention.

Summary and Conclusions

This presentation shows some of the results for two health education interventions which were characterized by their longevity (two years) and their strategy of repeating the same messages throughout the lengthy interventions.

The major findings show:

- A rate of approximately 30 to 40 percent of continuous maintenance of ORS knowledge (The Gambia only) and use over time after initial learning or use
- A pattern of forgetting and relearning and of stopping and restarting ORS use, and
- A substantial number of mothers learning about and starting to use ORS in the second year of the intervention

The findings suggest a need for long-term health education campaigns and repetition of messages to achieve and maintain high levels of learning and behavior change. We don't know what would have happened if the interventions described here had ended after only one year. However we assume that second year learning would have been much lower and that more and more mothers would have forgotten WSS instructions or stopped use of ORS and not restarted.

A question that arises from this is, how long does an intervention have to be? We see impressive gains in learning and use in a two-year intervention. But we also see forgetting and stopping use. How long does an intervention have to last to maintain a high level of knowledge and practice?