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A Report on Research Concerning
ORS Knowledge and Practice
Among Gambian Health Workers

Pamela Sankar
University of Pennsylvania
Philadelphia, Pennsylvania

for

PRITECH
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Contents

	PAGES
I. Background to Study.....	1
II. Summary of Findings.....	2
III. Research Design.....	3-5
IV. Research Findings.....	6-17
V. Footnotes.....	18
IV. Appendix.....	18-22

BACKGROUND TO STUDY

The Gambia hosted an experimental diarrheal disease control program from 1981-1984, called Mass Media for Health Practices (MMHP), sponsored by the Gambian government and the Academy for Educational Development (AED), Washington DC. A major component of this campaign was the dissemination of a home-mix formula for ORS (oral rehydration solution) and health worker training in ORS as the preferred treatment for diarrhea. This project's evaluation, presented in September 1985, indicated the success of the MMHP method for informing people about new health practices. Since the project's completion, the Gambian government has been unable to maintain most MMHP activities. Encouraged by the evaluation's positive results and acting on its on-going concern for improving diarrheal disease control efforts, the Gambian government recently expressed interest in reinstating a more vigorous diarrheal disease control effort.

Before undertaking this activity, however, the government wanted to assess the current (Fall 1983) status of ORS knowledge and practice in The Gambia. Toward this end, they contracted with PRITECH, Washington DC, to design and complete a study of the understanding and use of ORS among Gambian mothers and health workers. The study concerning mothers has been reported separately (See "Gambian Mothers' Understanding of Diarrheal Disease and the Use of Oral Rehydration Solution" Pamela Sankar, et al. December 1985. PRITECH). This report details the design and results of the

health worker study.

SUMMARY OF FINDINGS

1. Health workers have maintained an adequate knowledge of ORS basics including the sugar-salt solution (SSS) formula and administration.
2. Administration of inappropriate drugs, concurrent with or as an alternate to ORS continues, but is uncommon.
3. Understanding of the proper method of assessing a child's need for ORS is uneven. Some practitioners seem to be confusing the signs of diarrhea with the signs of dehydration, and this may lead to an undertreatment of mild diarrhea cases. Further, some health workers do not report using ORS to treat serious cases of dehydration while they are being transferred to IV facilities.
4. Mothers understanding of ORS is limited (corroborating findings reported in the companion report on mothers' ORS use). This is especially evident in mothers' misunderstanding of health workers instructions.

RESEARCH DESIGN

During the late summer and early fall of 1985, staff from the Medical and Health Department of the Gambian government conducted two informal evaluations of health worker practices based on direct interviews with health workers. These interviews demonstrated that health workers had retained a basic command of the ORS formula and administration practices. Anecdotal reports from the field indicated, however, that health worker practices did not always follow recommended protocol. To acquire a more accurate picture of what was happening day by day in the health centers, the design for this research needed to include some comparison between health worker statements and practices. Serious time constraints eliminated the option of observations at the health centers and researchers employed the following strategy instead.

The interviewer, a trained nurse, visited 11 health centers on days when they held clinics for children. He stopped each mother leaving the clinic and asked why she had brought her child to the clinic. If the mother's answer included "diarrhea", the interviewer asked the mother if she would answer a short questionnaire. (See Appendix One for a copy of this questionnaire). The questionnaire inquired about the mother's interaction with the health worker concerning treatment of the child's diarrhea, and the mother's understanding of ORS. After all the mothers had left, the interviewer talked with the health center staff

(dresser/dispenser, community health nurse, nurse/midwife, and nursing sister) about their diarrheal disease treatment practices. This design produced two sets of data concerning health worker practices: mother's statements about what health workers said (with some independent corroboration by entries on the Infant Welfare Cards--I.W.C.), and the health workers' own statements about their actions. Unfortunately this design does not permit a match between an individual mother and the health worker who treated her, rather only a match between a mother and the particular health center she attended.

Sampling

The original sampling plan called for visiting the 10 largest health centers in The Gambia (out of a total of 17) and maintaining a roughly even distribution over the three health regions: Western, Central, and Eastern. In this way researchers hoped to obtain the highest number of cases in the shortest traveling time. Severe petrol supply and scheduling problems grounded this plan. In the end, the interviewer visited 11 health centers--some large, some small--and interviewed 25 health workers. These health centers included: in the Western Region: Essau, Leman St. Serrekunda, Gunjur, Brikama, Brufut, and Bakau; in the Central region: Mansakango, and in the Eastern region: Georgetown, Sare Soffi, and Bansang Hospital. These sites were chosen by a fortuitous coincidence of available petrol

on a day when the clinic was in session.

At these sites, 53 mothers were eligible and consented to be interviewed. This number, 5% of all the cases presenting at the health centers on the days of the study, was lower than expected but within the normal range for November which does not have a high incidence of diarrhea. Of the 53 children whose cases were discussed, all were between the ages of one and 28 months. According to the nurse/interviewer's independent dehydration status evaluation of these children, all but one exhibited a normal hydration status. The one exception was evaluated as moderately dehydrated.

RESEARCH FINDINGS

Treatment Practices Reported in Health Worker Interviews

When asked how they treat children's diarrhea, several health workers stated that the first step was to establish whether the child was in fact suffering from diarrhea. Criteria for this determination varied but workers most frequently mentioned stool frequency. The number thought to constitute diarrhea ranged from 2 to more than 4 a day. Ten health workers said that if they determined that the child did not have diarrhea, they would treat him or her for something else, most often malaria.

In the process of determining whether the child was suffering from diarrhea, the health workers explained, they also began to assess severity. On the basis of this evaluation, the health workers would decide a treatment plan. Health workers disagreed on the criteria and categories of severity. Stool frequency and appearance were considered relevant. Characteristics of appearance most frequently mentioned included the presence of blood or mucous, and consistency. Other criteria mentioned included the episode's duration.

In addition to querying mothers about the characteristics of the diarrhea, the majority of health workers interviewed stated that they also asked the mothers about other ailments the child might have, such as fever. Twenty-three of the 25 health workers also reported that they

checked the child for signs of dehydration: sunken eyes, depressed fontanelle, and skin elasticity.

Based on information gathered in this evaluation phase, health workers assigned one or two of the following labels to the child's diarrheal episode: mild diarrhea, moderate or severe dehydration, chronic or persistent diarrhea, or offensive stool. These labels indicated to the health worker particular treatment practices. With one important exception concerning treatment of mild diarrhea, reported treatment practices were fairly consistent across health centers.

Treatment of diarrheas thought to be chronic or showing blood or mucous in the stool, usually would be treated with antibiotics such as sulpha dimidine (9 times), flagyl (5 times), penicillin (1 time) and tetracycline (1 time). Only two of the health workers treating with antibiotics specified that they would prescribe ORS along with antibiotics. In serious cases, two said they would recommend stool exams before treating, and four said they would refer these cases to better equipped facilities.

Most health workers believed that ORS was the appropriate treatment for mild diarrhea. Only one health worker reported that he would prescribe antibiotics along with ORS for mild diarrhea. Six health workers mentioned that they would ask the mother to return after 24 hours if there had been no improvement and another six mentioned that they would talk to the mother about the child's diet. For those health workers who treat mild diarrhea, they seem to treat it correctly. One-third of the health workers,

however, apparently do not see mild diarrhea as deserving treatment. This group will be discussed later.

There was no disagreement among health workers that ORS should be given for cases of moderate dehydration. Health workers describe moderate dehydration as the presence of the following signs: sunken eyes, depressed fontanelle, and reduced skin elasticity. Two health workers stated that they would also give antibiotics (sulpha dimidine) to moderately dehydrated children. Over half of the health workers who stated which type of ORS should be given for moderate dehydration, specified that the UNICEF packet was preferable to the home-mix solution.

One problem of administration appeared in both moderate and mild cases where UNICEF packets were prescribed for mothers to take home with them. Four health workers were confused about the practice of dividing UNICEF packets in half so that one packet could last for two days. These health workers were telling mothers incorrect amounts of water (one liter for each half packet) relative to packet amounts. This practice of dividing packets, whether or not it is officially sanctioned, occurs often enough that health workers either should be specifically told not to do it, or reminded how to do it correctly.

Health workers listed no unique markers for severe dehydration. They seemed to identify it simply as a worsening of the moderate dehydration signs. When a case was diagnosed as severe, however, all health workers reported that a different treatment approach was called for:

intravenous infusions. This procedure either could be performed locally or required transferring the child to a better-equipped facility. The health workers' statements do not indicate whether they felt it necessary to continue administering ORS during the transfer. Three health workers reported that they would also begin administering antibiotics to children with signs of advanced dehydration.

Although all health workers evidenced an accurate recall of the signs of dehydration, a certain confusion appears in several of the interviews which indicates that some of these health workers misunderstand the significance of the presence of these signs.

Several health workers have confused the signs of dehydration with the signs of diarrhea; that is, they seemed to equate the presence of dehydration signs--sunken eyes, depressed fontanelle, and decreased skin elasticity--with the presence of diarrhea, an accurate formulation. But at the same time, they equate the absence of these signs with an absence of diarrhea, a potentially serious mistake. Only when dehydration signs are present do they feel they should treat for diarrheal dehydration. This approach to treatment, if followed, would exclude children with mild diarrhea, or even children with more serious cases who have not yet begun to exhibit signs of dehydration, and would curtail ORS's use as a preventive measure.

Two-thirds of the health workers made this confusion in the section of the interview where they described how they

evaluate severity. Elsewhere in the interview, half of these health workers went on to describe a broader use of ORS which seem to rectify these earlier incorrect statements. Assuming that this latter group actually does understand the proper approach to prescribing ORS, only one-third of the health workers interviewed remain with the misunderstanding.

This reported practice of treating only when dehydration signs are present may account for some of the 24 cases that were not treated with ORS even though the mother claimed to have told the health worker that her child was having diarrhea. These untreated cases will be more fully explored in the following section. The eight health workers who constitute the one-third requiring the incorrect equation between signs of dehydration and presence of diarrhea are from the health centers where the majority of untreated cases were recorded. Of particular concern is that the one case of moderate dehydration (as evaluated by the interviewed) occurred at one of these health centers and went untreated.

In summary, the majority of health workers understand ORS mixing and administration and report ORS as the standard, preferred treatment for a large portion of diarrheal cases. There is a possible lapse in protocol with the failure to administer ORS either along with antibiotics to children with chronic diarrhea, or during transfers of severely dehydrated patients to IV facilities. A significant minority (one-third) do evidence a serious confusion in describing how

they evaluate the severity of a child's diarrhea, however all the health workers interviewed did understand the basic approach to assessing a case of diarrhea.

Treatment Practices Reported by Mothers' Interviews and Infant Welfare Cards

The previous section reported what health workers said they would do to treat cases of diarrhea. This section concentrates on what they actually did do in selected cases. This data is derived from mothers' statements about health worker actions and Infant Welfare Card (IWC) entries. The presenting complaints and the treatments prescribed are written on the IWC. This provides a valuable check against what mothers and health workers say about treatment practices.

In large part the findings in this section confirm statements of health workers reported on above: nearly half of the mothers (24 of 53) reported that health workers treated their children's diarrhea with ORS. IWC entries confirmed these statements and added an additional 4 cases treated with ORS bringing the total to 28. This discrepancy between the number of mothers reporting ORS prescription and the number of IWCs showing ORS prescription can be accounted for by attributing it either to mothers' inability to recall treatments or, in the case of multiple treatments, to mothers' difficulty associating correctly a particular treatment with a particular ailment.

Combining data from both mothers' reports and IWCs, the following distribution of ORS prescription emerges. Eighteen mothers were told to make sugar-salt solution at home, eight were told to get a UNICEF packet to take home, and two were given a bottle of the mixture already made to administer at

home.

Although ORS is the recommended treatment for most episodes of diarrhoea, two problems appear in the cases reported here. First, three mothers in this group reported that they had already been treating at home with SSS before coming to the clinic, two for three days and one for five days. Especially for the five-day case, the wisdom of continuing to give SSS with no other treatment should be carefully evaluated. Second, and a topic that will be more fully explored in the following section: a high number of mothers told to make SSS or the packet at home did not understand these instructions thereby nullifying what could have been an effective treatment.

In the 28 cases treated with ORS, there are 4 in which accompanying antibiotics are prescribed. It is impossible to know whether these drugs are intended to treat the diarrhoea or some other ailment the child has. Sulpha dimidine and flagyl are prescribed once each and penicillan twice. These may well be cases of diarrhoea which, as the health workers described in their interviews, called for antibiotics: cases either of persistent diarrhoea or of stools with blood or mucous. In three other cases health workers prescribed ferri tonic, in two others nivaquine, and four others, mist. gripe. There is insufficient data to evaluate whether prescription of these drugs in addition to ORS conformed to recommended treatment protocol.

The remaining 24 children of the 53 cases analyzed, did not have diarrhoea written on their IWC nor was there any form

of ORS treatment listed.¹ Treatments listed included aspirin (16 times), chloroquine (13 times), penicillin (4 times), phenegan (4 times), nivaquine (2 times), and ferri tonic (one time).

There are several possible explanations for the omission of the complaint of diarrhea and its treatment from the IWC. It may mean that the mother did not report diarrhea as an ailment to the health worker, but did report it to the interviewer. There is no obvious reason for this behavior, and it seems an unlikely explanation.

Perhaps the health worker forgot to write the diagnosis and treatment on the card. On nine other cards, health workers failed to note diarrhea as a complaint, but they did remember to write that they had treated the child with ORS thereby signaling that they considered this child to have a case of diarrhea. It seems unlikely that health workers forgot to record both diagnosis and treatment in 24 cases.

Another possible explanation is that these are cases where the health worker decided that the child did not have diarrhea and therefore did not need to be treated for it. This hypothesis is circumstantially supported by the fact that these untreated cases concentrate in the clinics where at least one of the health workers equated presence of diarrhea with signs of dehydration thus limiting treatment of mild diarrhea.

This practice concentrated in the Eastern region (15 out of 24 cases). The Eastern region health centers which the interviewer visited were staffed primarily by the travelling

team from Bansang Hospital. Therefore most of these 15 cases can be attributed to their care. It may be that the Bansang team has simply chosen not to embrace the ORS treatment. This pattern confirms a suspicion which members of the Medical and Health Department in Banjul expressed: that the medical team from the People's Republic of China stationed at Bansang is not recommending ORS to their staff.

Based on available information, the IWC and mothers' reports, it is difficult to determine whether the Bansang team is treating milder cases of diarrhea with some other medicine or whether they are not treating them at all. IWCs list all the treatments given during a particular visit but they do not specify which treatment was given for which ailment. Omitting treatments obviously not for diarrhea (such as eye ointment), a review of the 15 non-ORS IWCs from the Bansang teams reveals the following distribution of treatments: aspirin 13 times, chloroquine 10 times, mist. gripe 5 times, penicillin 4 times, and phenegan 3 times. This pattern is essentially similar to the other cases in the non-ORS treatment category with high use atit-febrile medications and some antibiotics.

Excluding the Bansang data, actual treatment practices seem to match fairly well with reported practices: a high use of ORS for mild diarrheas accompanied by occasional use of antibiotics, possibly for chronic diarrhea or because of blood or mucous in the stool. There were no cases of

moderate or severe dehydration which were treated so that it is not possible to assess whether these treatment patterns would have matched reported practices. The one opportunity to treat a moderately dehydrated case, apparently, was overlooked. One crucial link remains to be considered in evaluating health workers use of ORS: are they making their mixing and administration instructions clear to the mother.

Mothers' Understanding of Health Worker ORS Instructions

Twenty-eight mothers left the health center with instructions to treat their children with some form of ORS: home-mix SSS, a UNICEF packet, or a bottle of the solution already mixed. Although it is clear from the health worker interviews that health workers understand the mixing and administration instructions and that they believed that they had properly conveyed these instructions to mothers; it is also clear that many mothers did not understand them. Four women who were prescribed ORS did not even acknowledge that this was a treatment for diarrhea. When asked what they had been given to treat their children's diarrhea, they answered 'tablets.'

The rest of the mothers who had been prescribed ORS did understand that it was a medicine for diarrhea. Of the eight mothers given UNICEF packets, two did not get the packet because supplies had run out and no other treatment was prescribed; another two did not know the proper way to mix and administer ORS once they arrived home. Of the two

receiving ORS already mixed, one did not understand how to administer it.

Of the 18 mothers told to make sugar-salt solution at home, 9 understood how to mix and administer the solution. Two others said they would rely on other people to mix it for them because they did not know how to. The remaining 7 made errors either in recounting how to mix or administer the solution. In total, of the 28 mothers told to use some form of ORS, over forty per cent were unable to carry out these instructions. Most of these problems were due to mothers' inadequate understanding of ORS procedure.

Several health workers commented that they realized that mothers often needed more information during the clinics but these health workers also commented that they did not have time to educate mothers during clinic sessions. Other health workers unfortunately did not appear to realize that mothers did not understand them. Greater availability of flyers might ease this situation by diminishing the time needed for active teaching. A note of caution, however. One mother who received a flyer told the interviewer that she did not know what it was for and she was unable to interpret it. These flyers, though simple, do need explanation.

FOOTNOTES

1. These two figures, 28 cases receiving ORS and 24 not, do not add up to the total sample of 53. One case did not fit into either category. In this case the mother reported that the health worker had told her to go to the lab for a stool exam and then to return to the health center for treatment.

HEALTH CENTER INTERVIEW WITH MOTHERS

Clinic _____
Number _____

1. Age of child _____
2. What did the health worker say was wrong with your child?
3. What did you tell the health worker was wrong with your child?
4. What did the health worker do to treat your child's diarrhea?
5. What did the health worker tell you to do to treat your child's diarrhea? (Have the mother describe in detail what the health worker told her to do--for example, whether she should administer medicines, how often and how much, or whether she should return to the clinic, and so on).

6. If the health worker gave you something, may I see it?
(Describe what the mother gives you--type of tablets, packet,
and so on).

7. May I see your IWC (Infant Welfare Card)? (Record exactly
what is written on the card for the current visit).

8. If there are any discrepancies between what is written on the
card and what the mother says, please ask the mother about them and
note down what she says.

9. Your own estimation of the child dehydration status:

_____ normal hydration
_____ moderately dehydrated
_____ severely dehydrated

10. Did you give ORS before coming to the clinic?

_____ no
(go to q. 16)

_____ yes
(go q. 11 and finish
interview at q. 15)

11. How did you mix the solution?

12. How much of the solution did you give the child?

13. When did you begin giving the solution to the child?
(how many hours or days before coming to the clinic).

14. Did you do anything else for the child before coming to the clinic? (Like giving tea or going to the herbalist).

15. Why did you decide to come to the clinic? (Probe to get at whether the mother based her decision on the severity of the diarrhea or other factors. Get beyond answer "to obtain treatment").

If answered "yes" to #10, end of interview.

16. Do you know what ORS is?

_____no
(go to q. 19)

_____yes

17. How do you make ORS?

_____ doesn't know

(explains formula)

18. Why did you decide not to use ORS?'

19. What, if anything, did you do to treat your child before coming to the clinic?