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Understanding Mothers' Knowledge and Behavior Related to the Treatment of Diarrhea in Young Children in West Java, Indonesia: Recommendations for Health Communication

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BACKGROUND AND DESCRIPTION[1]

Health Communication for Child Survival (HEALTHCOM) is a five-year communication program designed to assist developing countries promote the widespread use of effective child survival strategies. HEALTHCOM is sponsored by the Office of Health and the Office of Education within the Bureau for Science and Technology of the U.S. Agency for International Development and is administered by the Academy for Educational Development. The program will work in up to 17 countries, using a research and development approach to promote changes in behavior that affect child health. The Annenberg School of Communications is responsible for summative evaluation in 15 countries and for providing assistance in formative evaluation when requested.

In July and August of 1986, the Government of Indonesia began to intensify a public health program to reduce infant and child mortality resulting from diarrheal diseases.[2] The program is

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[2]The Health Department conducts the program under its Directorate of Communicable Disease Control and its Sub-Directorate of Diarrheal Disease Control. Technical assistance for the communication component is provided by the Center for Community Health Education in collaboration with HEALTHCOM. Additional funding is provided by USAID in Jakarta.

active on a national scale in Indonesia, although the major efforts to date have been centered in West Java province (with a population of approximately 32 million). The West Java interventions are designed to promote the use of oral rehydration therapy (ORT) to treat cases of infant and child diarrhea. The oral rehydration solution promoted in West Java is called Oralit.

The ORT program in West Java targets three populations of primary health care providers: mothers (and other caretakers of children under the age of five), health care workers at regional clinics (puskesmas workers), and local volunteers (kader). The program teaches each population of health care providers to distinguish between four types of diarrhea -- beginning diarrhea, diarrhea with weakness, diarrhea with vomiting, and prolonged or bloody diarrhea -- and to provide correct treatment for each type of diarrhea.

The project in West Java began in 1986 with a pilot phase in Garut Regency. During this phase, a limited number of ORT interventions were carried out. These activities included the production and airing of three radio messages; training of health workers, health volunteers, and a limited number of retailers of medicines; and the production and distribution of training materials (posters, flyers, kader badges and house signs, certificates of training, and reporting forms).

In January 1987, activities were expanded into other regencies in West Java (i.e., Bandung metropolitan area, Bandung provincial area, and Tasik Malaya). The first set of activities in this expansion was the revision of the health volunteer training system and training of new volunteers using this system. Activities in 1988 and 1989 will include the development and broadcast of messages through the mass media, and the development of new print materials and training activities.

In February and March of 1988, before the start of these new activities, interviews were carried out with a sample of 1000 caretakers from five regencies (the four intensification regencies -- Garut, Tasik Malaya, rural Bandung, and the city of Bandung -- and one regency chosen as a control, Subang). Interviews were also conducted with a small sample of health workers from the health centers, health volunteers, and retailers. These interviews will serve as a baseline against which to measure the impact of activities taking place in 1988 and 1989. However, the data were also used in program development to provide the implementers with information about their target audience.

This field note presents some of the results of the survey of mothers which were provided to help guide the development of communication materials in the West Java program. It examines a number of questions about what mothers know and do about diarrhea in their young children and discusses the implications for a communication intervention. The following questions were posed:

What is the incidence of diarrhea among children under five years old in the sample?

What symptoms lead a mother to decide that a case of diarrhea is serious and what symptoms are cues for treatment of the case?

What treatments are currently being given for diarrhea?

How are mothers currently feeding their children when they have diarrhea?

What do mothers already know about Oralit?

What communication channels are most appropriate to reach the audience?

These questions will be addressed in the sections to follow.

What is the Incidence of Diarrhea among Children under Five Years Old in the Sample?

Mothers were asked if any of their children under five years of age had loose stools on the day of the interview and, if not, when the last case of diarrhea in one of these children had occurred. We found that 20 percent of the mothers reported having a child with diarrhea within the month prior to the interview (including nine percent with diarrhea on the day of the interview) and 71 percent had a child with diarrhea more than a month before. Only nine percent reported that none of their children under five years old had ever had diarrhea.

We were interested in knowing more about recent cases (in the last month) to understand whether certain groups of children were more likely to have diarrhea than others.[3] The mothers of these children could then be special targets of the health communication activities in West Java. We compared mothers who had cases within the last month, those with less recent cases, and those who never had any cases across a number of socioeconomic factors (education, monthly expenditure, family size, ownership of certain household items), and by geographic area. We found no significant differences in incidence of diarrhea by socioeconomic status or by whether the family lived in a city or rural area. This suggests that no specific group of mothers had higher prevalence of diarrhea in their children than another and that targeting mothers with higher rates of diarrhea in their children will not be necessary. All mothers are potential target groups based on diarrheal incidence figures.

[3]This is based on the assumption that women reporting more recent cases tend to have more cases of diarrhea in their children overall than mothers reporting a case at an earlier time.

The only significant difference (at $p<.05$) in diarrheal incidence was found between regencies. Mothers in Subang Regency (the control area) were significantly less likely to report a case of diarrhea on the day of the interview and more likely to report that none of their young children had ever had diarrhea (see Table 1). This seems to be because of language differences in Subang. Twenty-five percent of the mothers in Subang said their family spoke Javanese at home rather than Sundanese (75 percent), while almost all of the mothers in Tasik Malaya, Garut and Bandung regencies spoke Sundanese at home, and 81 percent of mothers in Bandung City spoke Sundanese (18 percent saying they spoke Indonesian at home).

The majority of the interviews were carried out in Sundanese, the most common language in that part of West Java. If a mother couldn't understand Sundanese well, she was interviewed in Bahasa Indonesia, the national language. Fifteen percent of the mothers in Subang were interviewed in Indonesian and 52 percent of these mothers reported never having a case of diarrhea in their young children (see Table 1). It is possible that the words for diarrhea used in the Indonesian interviews had a different meaning for women whose first language was Javanese. This problem was not seen among the mothers in the city of Bandung who were interviewed in Indonesian (but whose first language was Indonesian). Mothers in Subang who were interviewed in Sundanese were also more likely to report never having a case, but their responses do not differ as dramatically from those of mothers in other regencies as do those given by the Javanese speakers.

Table 1
Reported Incidence of Diarrhea in the Five Sample Regencies

Last Case	Tasik Malaya	Garut	Bandung Regency	Bandung City	Subang
All Mothers*					
Within last month	23.5	24.0	22.0	21.0	11.0
More than one month ago	65.0	70.5	73.0	74.0	70.0
Never	11.5	5.5	5.0	5.0	19.0
	n=200	n=200	n=200	n=200	n=200
Mothers Interviewed in Sundanese					
Within last month	23.7	24.2	22.3	23.3	11.2
More than one month ago	64.6	70.7	72.6	72.7	75.7
Never	11.6	5.1	5.1	4.0	13.0
	n=198	n=198	n=197	n=150	n=169
Mothers Interviewed in Indonesian**					
Within last month				14.0	9.7
More than one month ago				78.0	38.7
Never				8.0	51.6
				n=50	n=31

*Difference between regencies significant at $p<.05$.
** Figures are not provided for Tasik Malaya, Garut, and rural Bandung regencies because only 2 to 3 women were interviewed in Indonesian.

After identifying this important difference between the regencies, we compared mothers in the five regencies on a number of other characteristics. We found that mothers in Subang differed significantly (at $p<.05$) from mothers in the four intervention regencies in language, level of education, access to health and other services (electricity, schools, cities), and use of media other than radio. Because of these differences, we did not include mothers from Subang in the figures reported in the rest of this report. The following pages present a picture of the mothers in the four areas in which the intensification activities will be focussed.

In summary, the diarrhea incidence figures for the four intervention regencies are as follow: 23 percent of the mothers reported a case in the last month, 71 percent reported a case more than a month before, and seven percent said their children under five had never had diarrhea.

What symptoms lead a mother to decide that a case of diarrhea is serious and what symptoms are cues for treatment of the case?

We wanted to understand what symptoms mothers associated with more severe cases of diarrhea and what symptoms were associated with treating a case. This information could then identify specific symptoms that could be used in health communication messages to tell the mother when she should begin to treat a case and when she should take the child to a health center.

Cues for Severity

In the questionnaire, mothers were asked about the last time one of their children had a case of loose stools and then were asked a series of questions about the symptoms the child exhibited

during this case and the mother's view of the severity of the case. Ninety-eight mothers said none of their children had ever had a case of loose stools. The majority of mothers who had a child with a case of diarrhea in the past (746 mothers) reported that the child with the most recent case had been "a little bit sick" (73 percent). Eleven percent said the child had been very sick, and 16 percent said the child had not been sick at all.

We then wanted to know, what symptoms does the mother identify with the child being a little sick or very sick? Table 2 shows the percent of children in each severity category (not sick, a little sick, and very sick) who were reported to have had a given symptom. All symptoms showed significant differences (at $p<.001$) between the severity groups. However, certain symptoms seem to distinguish more clearly between different levels of severity than the others.

Mothers were more than six times as likely to say a child who was a little sick had vomited than a child who was not sick at all. Mothers were almost three times as likely to say a child that was a little sick (compared to not sick at all) played less or had less appetite during the diarrhea. Although fever may also seem to be a good cue (80 percent of children considered a little sick had a fever), one can see that over half the children who were assessed as not sick also had a fever. Fevers seem to be common in all levels of diarrhea. Thus, <u>lassitude</u> (playing and eating less) and <u>vomiting</u> seem to be more important cues to indicate that the child is sick at all (a little sick versus not sick).

Two symptoms, <u>vomiting</u> and <u>blood in the stools</u>, stand out as possible cues for distinguishing very sick children from slightly sick children. Mothers were approximately twice as likely to say

considered very sick were most likely to be taken outside the home for treatment. No differences were seen between urban and rural women or between women of different economic levels in their assessment of the child's status.

In summary, loss of appetite, less playing, and increased thirst are signs that could be used as cues that some kind of treatment is required (but that the child is only a little bit sick). Vomiting and blood seem to tell the mother that the diarrhea is serious and needs special treatment and could be used in health education messages as cues for the mother to take the child for treatment.

What treatments are currently being given for diarrhea?

Overall, 87 percent of the last case of diarrhea in a household were reported to have been treated in some way.[4] Thirteen percent of cases were not treated at all (went away by themselves), 35 percent were treated at home only, 40 percent were treated at home and also taken outside the home for treatment, and 12 percent were taken for treatment only and not treated at home. No significant differences in treatment were

[4]This figure may be a high estimate of diarrhea treatment. Mothers may have thought the interviewers were associated with the health department and may have tried to give a "good" answer by saying they had treated a case. However, the high levels of treatment may also be due to mothers reporting more serious cases. Although we tried to use a term for diarrhea that would cover even the mildest case, mothers may still have remembered or reported more serious cases. We don't know of other surveys reporting incidence of mild, moderate, and severe diarrhea with which to compare our results.

seen between urban and rural mothers or between mothers of different economic levels.[5]

Types of Treatment Given at Home and Outside the Home

For the cases that mothers said they treated at home, the most frequently named treatments were pills (enterovioform and sulfa), Oralit, and herbal liquids. A more detailed breakdown of home treatments is displayed in Table 4. Almost half the mothers who gave treatments at home bought over-the-counter enterovioform or sulfa pills, which are generally not considered effective drugs in the treatment of any kind of childhood diarrhea.

Fifty-one percent (382) of the children who had ever had diarrhea were reported to have been taken outside the home for treatment. The majority of children taken for treatment (78 percent) had also been treated at home. In their report on a qualitative survey on diarrhea, Survey Research Indonesia reported that the common pattern for treatment of moderate diarrhea cases was home treatment with traditional remedies or

[5]A variable measuring economic level of the mother's household was developed using the responses to a question about monthly household expenditures. The mothers were asked to identify which of nine categories best represented her household expenditures in a month (e.g., less than Rp. 10,000; Rp. 10,001-20,000; etc.). However, a large household might spend more a month than a small household, but actually have less expenditure per person. Therefore, a per capita measure was developed by assigning to each mother the midpoint of her expenditure category (i.e., a mother who said her monthly expenditures were between 10,001 and 20,000 Rp. was assigned the value of 15,000 Rp.) and this number was divided by the number of people in her household. Per capita expenditure ranged from 1667 Rp. to 54,167 Rp. Mothers were then grouped into three economic levels: the lowest 40 percent of monthly expenditures (1667-10,000 Rp.), the middle 40 percent (10,001-17,500 Rp.) and the top 20 percent (17,501-54,167 Rp.).

Table 4
Treatments Mothers Reported Giving at Home

Treatment	Percent of Cases*
Pills	48.0
Enterovioform	27.6
Sulfa	22.3
Oralit	25.8
Herbal Liquids	18.5
Medicinal Rubs	14.8
Strong Tea	9.1
Sugar/Salt Solution (LGG)	7.1
Syrup	4.3
	n=561

*Percentages add up to more than 100 percent because the question allowed the mothers to name more than one treatment.

over-the-counter drugs, then treatment by a medical professional if the diarrhea was not cured by the home remedies.[6] Serious cases tended to be taken to the health center or doctor as a first step.

Of the children taken for treatment, 86 percent were taken to only one place for treatment, 13 percent were taken to two places, and one percent were taken to three places for treatment. Children most frequently were reported to have been taken to the health center or hospital (57.9 percent), a private doctor (29.8 percent), or a private nurse or midwife (13.6 percent). A small

[6]Survey Research Indonesia. "A Qualitative Survey on Oral rehydration Therapy in Five Regencies in West Java." Prepared for the United Nations Children's Fund and the Department of Health of the Republic of Indonesia, March 1985.

percentage (3.1 percent) of the children were taken to a health post or health volunteer for treatment of diarrhea.[7]

Significant differences (at $p<.05$) were seen in treatment choices between urban and rural mothers. Rural mothers were more likely to report taking their children to a health center (63 percent of rural compared to 46 percent of urban cases) or nurse (17 percent of rural compared to six percent of urban cases), while urban mothers were more likely to say they took their children to a private doctor (54 percent of urban compared to 20 percent of rural cases). In rural areas, visiting a doctor differed significantly (at $p<.05$) between mothers of different economic levels. Thirteen percent of rural mothers in the low economic category took their child to a doctor, compared to 22 percent in the middle category and 44 percent in the top economic category. This suggests that there is a tendency for those who have access to a greater variety of medical services (city women) or those with more resources to choose to see a doctor about their children's diarrhea.

We then examined the treatments provided by different sources, using the data about where the mother first took her child for treatment and what was given at that place.[8] Fifty-four percent of the 382 mothers who said they took their child somewhere for treatment went to a health center or hospital first, 25 percent went to a doctor, 11 percent went to a private nurse or midwife,

[7]Percentages add up to more than 100 percent because some mothers reported going to more than one location.

[8]We looked only at the first place the mother went because we wanted to do analyses with a base of 100 percent. Because some mothers went to more than one place for treatment, the figures reported above add up to more than 100 percent. The overall percentage of cases taken to any one place first compared to those taken to these places first, second, or third are very similar.

six percent went to a friend, neighbor, relative, or traditional healer, three percent went to a volunteer or health post, and one percent went to a shop or drugstore.

What kinds of treatments did the mothers get when they took their child for treatment of diarrhea? The most frequent treatment given was pills (54.2 percent), antibiotic syrups (45.3 percent of the cases), followed by Oralit packets to take home (26.2 percent), injections (9.2 percent), vitamins (6.3 percent), mixed Oralit given at the facility (3.4 percent) and herbal liquids (2.9 percent). Many mothers were given more than one remedy.

These figures indicate quite high prescription of drugs for diarrhea in young children (syrups, pills and injections) suggesting some inappropriate practice among medical professionals.[9] The government health workers in West Java are instructed to give drugs only to those cases showing signs of cholera and dysentery, estimated at 20 to 30 percent of cases.[10] The figures indicate that health personnel in the four regencies in the sample provided drugs in up to twice as many instances as recommended.

[9]A recent letter to the editors of Dialogue on Diarrhea (June 1988, Issue No. 33, p. 7) brought up the problem of parents and relatives being too worried to wait for diarrhea to stop in a child with just ORT and demanding drugs to stop the diarrhea. The author asked for advice on the role of anti-diarrheal drugs and antibiotics in the treatment of diarrhea in young children. In their response, the editors replied, "Anti-diarrhoeal drugs are mostly inappropriate, ineffective and sometimes dangerous for young children."

[10]Personal communication with Dr. Sutoto, Chief of the Sub-Directorate of Diarrheal Disease Control, Ministry of Health, December 15, 1988.

We then looked at treatment given by each type of facility visited to better understand the pattern of treatment (see Table 5). The majority of mothers who took their child to a health center or hospital, a doctor, or a private nurse or midwife were given pills. Doctors were the most likely of the people consulted to give antibiotic syrups for diarrhea and private nurses or midwives were the most likely to give injections for diarrhea. Mothers who went to a traditional healer, friend or relative were most likely to receive herbal liquids and mothers who went to a shop or drug store tended to get pills for their child's diarrhea.

Table 5
Treatment Given by Facility Visited First

Treatment	Health Center/ Hospital	Doctor	Nurse/ Midwife	Health Post or Volunt.	Healer/ Relative/ Friend	Shop
Oralit to Take Home	32.9	13.8	9.3	91.7	15.8	14.3
Oralit to Drink	5.3	1.1	0	0	5.3	0
Syrup	39.6	77.7	39.5	8.3	0	0
Pills	57.5	56.4	60.5	8.3	10.5	85.7
Injection	11.1	4.3	18.6	0	0	0
Vitamins	7.7	3.2	11.6	0	0	0
Herbal Liquids	0	0	0	0	57.9	0
SSS	0.5	0	0	0	0	0
	n=207	n=94	n=43	n=12	n=19	n=7

We found that the very few mothers who had taken their child to a volunteer or health post for the last case of diarrhea were much more likely to have been given Oralit packets to take home (92 percent) than mothers who went to a health center/hospital (33 percent), doctor (14 percent) or private nurse or midwife (nine percent). However, only 12 mothers reported going to a volunteer or health post for the last case.

The figures indicate that choice of treatment source can have a large effect on whether the mother is given Oralit packets to take home. The implications of this can be seen when one compares the four geographic areas. Mothers in Bandung City were half as likely to be given Oralit to take home as mothers in the other three, more rural districts. This is probably because over half the cases in Bandung City that were taken for treatment were taken to a doctor, and doctors were unlikely to give Oralit packets to take home.

When Oralit is recommended, the mother is supposed to be given five packets to take home. The data show that only 18 percent of the mothers were given five or more packets to take home (see Table 6). The average number of packets given to a mother was 2.8. Thirty-four percent of the mothers who were given Oralit received only one packet.

Table 6
Number of Packets of Oralit Given to Mothers

Number of Packets	Percent of Mothers
1	34.0
2	23.0
3	21.0
4	4.0
5 or more	18.0
	n=100

Summary

Overall, we found a high level of treatment of diarrhea cases among mothers in the four regencies in the sample. Eighty-seven percent of the last case of diarrhea were given some kind of treatment -- 75 percent were treated at home and 51 percent were taken outside the home for treatment (primarily to a health center, doctor, or nurse). The most common home treatments were over-the-counter pills (48 percent), Oralit (25 percent), herbal liquids (19 percent), and medicinal rubs (15 percent). Children who were taken outside the home for treatment were most likely to be given pills (54 percent), antibiotic syrups (45 percent), and Oralit to take home (26 percent). Many received more than one remedy for diarrhea.

Source of treatment was significantly related to the remedy given: children who were taken to medical professionals (health center, hospital, doctor, or nurse) were likely to be given pills and syrups. Almost all children taken to a health post or volunteer were given Oralit, however, only 12 mothers (three

percent) took their child to a health post or volunteer. The other source likely to give Oralit as a remedy was the health center or hospital -- 33 percent of children who were taken were given Oralit packets to take home.

In cases where Oralit packets were given to the mother, only 18 percent of mothers received the number of packets recommended (five). Over half the mothers received only one or two packets. We don't know whether this is because the health workers didn't have enough packets to distribute five at a time, which would indicate that packet distribution needs to be addressed, or if the health workers felt it was only necessary to give the mother one or two packets, which would indicate that this information could be stressed in training programs.

The availability and use of drugs among mothers and health professionals may be barriers to increasing the use of Oralit in rural West Java. If mothers are accustomed to buying anti-diarrheals at the shops or to being given drugs by their health worker or doctor, they may not be willing to use Oralit, particularly if they can see no immediate benefits.

Qualitative surveys carried out in five West Javan villages have suggested that mothers want a "cure" for diarrhea when they choose treatments.[11] Oral rehydration solutions do not stop diarrhea and may actually make the diarrhea worse at first. The qualitative surveys also indicated that the time required to prepare herbal remedies was a factor in some women's decisions to use over-the-counter drugs. Oralit requires time to administer correctly. In comparison, pills, syrups, and injections may be easier to give and seem to stop the diarrhea. These issues are

[11]Survey Research Indonesia, 1985.

important to consider in developing an information program to promote oral rehydration solution.

Health professionals seem to give a high level of drugs for diarrhea cases. We don't know if this is due to their own beliefs about how a case should be treated, or if they give mothers drugs because the mothers expect or ask for them. More research is needed to understand why mothers and health workers currently give children drugs for diarrhea. The data suggest that a comprehensive ORT program should continue training government health professionals at all levels in correct treatment of diarrhea and use of ORT. However, it is also important to address private doctors and nurses, particularly in the urban areas of West Java. Policies and practices in the use of drugs also will have to be considered in trying to expand the use of oral rehydration solutions in West Java.

The current policy in West Java is to rely heavily on village volunteers to provide mothers with Oralit packets and to train them in correct treatment of diarrhea cases, either in their homes or at the health post. The data show that, although health volunteers were highly likely to prescribe oral rehydration solution, they were rarely visited when a child had diarrhea. This would suggest that, unless mothers can be motivated to take their children to volunteers for diarrhea cases or the volunteers can be motivated to seek out mothers to give them packets and training, this channel may not be the best way to reach mothers.

How are mothers currently feeding their children when they have diarrhea?

An important part of treating a child with diarrhea is to continue to give the child breast milk and other foods to maintain the child's nutritional status and to give the child

more liquids to prevent dehydration. We asked mothers what foods their children were eating before they became ill, if they continued breastfeeding, if they gave more food or liquid, if they gave the child special foods or liquids, and if they withheld any foods or drinks. Out of the 746 mothers whose child had diarrhea, 10 percent reported that the last child with diarrhea was breastfeeding exclusively before the diarrhea started, 55 percent had a child that was being given breast milk and solid foods, and 35 percent said the child was eating solids only.

Mothers who said their child was still being breastfed were asked if, during the time the child had diarrhea, she breastfed more often, less often, or about as often as usual. A small proportion (15 percent) of the mothers reported reducing breastfeeding during diarrhea. Over half (53 percent) of the mothers said their child was breastfed more often and 32 percent said the child breastfed as usual.[12] There were no significant differences in breastfeeding during diarrhea between urban and rural mothers or between mothers of different economic levels.

Continuing solid foods during diarrhea seemed to be a greater problem than continuing breastfeeding. Mothers of children who were eating solids were asked if the child ate about the same amount of food, less food, or not at all. Only 31 percent of the mothers reported that their child ate the same amount of food as usual. Sixty-six percent said their child ate less and three percent said their child stopped eating altogether. Almost all (97 percent) of the mothers with children who ate less reported that the change in eating was because the child didn't want to

[12]The Survey Research Indonesia study found the same patterns of breastfeeding during diarrhea, but noted that the increase in breastfeeding during diarrhea is not due to the mothers' understanding that the child needs more liquids, but because the child is more fretful and refuses solids.

eat rather than because she thought the child should have less food. Mothers in the rural areas were significantly more likely than urban mothers to report that their child ate less food (see Table 7).

Mothers of children who were already eating solids were then asked if they gave any special foods during the diarrhea or if they gave more of any foods. Thirty-six percent of the mothers reported giving the child special foods and 64 percent reported giving the same food the child was eating every day. Mothers most frequently named rice porridge as a special food given during diarrhea (see Table 8). We don't know the nutritional value of the rice porridge given to these children. If the porridge is a thin gruel with only rice and water, it may have little of the special nutrition a child requires during diarrhea. This would indicate a problem with feeding of children during diarrhea. More investigation needs to be done to determine the nutritional value of rice porridge, which was given as a special food in 29 percent of the cases of diarrhea. Other special foods were eggs, rice, mashed fruit, and vegetables, which may be more nutritious than the porridge.

Table 7
Quantity of Food Eaten by Children with Diarrhea

Amount of Food Eaten	Total	Urban	Rural*
Same as before	31.1	37.5	28.3
Less than before	65.9	58.7	69.2
Stopped eating	3.0	3.8	2.6
	n=675	n=208	n=467

*Difference between urban and rural mothers is significant at $p<.03$.

Table 8
Foods Given as Special Foods or
Given in Greater Quantity During Diarrhea
(Percent of Children Who Were Eating Solids)

Food	Percent Given as Special Food	Percent Given More of the Food
Porridge	28.5	6.4
Eggs	7.6	3.7
Rice	2.7	0
Mashed bananas/ Fruit	1.5	1.8
Vegetables	1.6	1.5
	n=673	n=675

In the rural areas, giving special foods was significantly associated (at $p<.0001$) with economic level of the family. Fifty-two percent of rural mothers in the high economic group gave special foods, compared to 39 percent in the middle group, and 25 percent in the low group. The same relationship was seen among urban mothers, but was not statistically significant. It may be that poorer women have less time to make special foods or less money to buy the ingredients.

Fifteen percent of mothers reported giving their child more of certain foods. The foods most frequently given in greater quantity were rice porridge, eggs, mashed fruit, and vegetables (refer back to Table 8).

When mothers were asked if they stopped giving or gave less of any foods during diarrhea, 47 percent reported that they did withhold or reduce foods. The foods most frequently withheld or

reduced were oily foods, hot spicy foods, and sour tasting foods (see Table 9).[13] There were no differences in this behavior between urban and rural women or between women of different economic groups.

Table 9
Foods Reduced or Withheld During Diarrhea
(Percent of Children Who Were Eating Solids)

Foods	Percent
Oily foods	28.1
Hot spicy foods	17.5
Sour tasting foods	15.6
Sweet foods	4.2
Fishy smelling foods	3.0
Fruits	2.2
	n=673

Giving children liquids during diarrhea is also very important. We asked all mothers whose child had a case of diarrhea about what her child drank during the time he or she had diarrhea. We also asked about the child's thirst during the diarrhea. A majority of mothers (61 percent) noticed that their child was more thirsty during the time he or she had diarrhea. Thirty-two percent of the mothers said the child was about as thirsty as usual, and seven percent said the child was less thirsty.

[13]Survey Research Indonesia reported that mothers moved to feeding older children softer foods during diarrhea and moved away from giving foods they considered hard to digest (oily, hot, or sour foods).

We then asked if the mother had given the child any special drinks, if she had stopped or given less of any drinks, and if she had given more of any drinks. Forty-three percent of the mothers said they gave their child special drinks and 39 percent reported giving more of certain liquids. The most common liquids given as special drinks were Oralit, strong tea, and herbal liquids (see Table 10). Mothers reported increasing the volume of breast milk, water and tea during diarrhea. Urban mothers were more likely than rural mothers to give special drinks (48 percent of urban mothers compared to 40 percent of rural mothers) and to give more of certain drinks (45 percent of urban mothers compared to 36 percent of rural mothers). However, these differences were not very large.

We were also interested in knowing if mothers withheld or reduced the volume of any liquids during diarrhea. Only 16 percent of the mothers reported that they did so, the majority saying that they stopped giving or gave less of iced syrup (10 percent of all mothers), sweet water (four percent), or coconut water (3.5 percent). Again, urban women were more likely than rural women to stop or reduce drinks (23 percent of urban women compared to 14 percent of rural). This may be because iced syrup and sweet water are more readily available in the cities, thus more urban children may have these drinks, and then have them reduced during diarrhea.

Table 10
Liquids Given as Special Drinks or
Given in Greater Quantity During Diarrhea

Liquids	Percent of Children Given Special Drink	Percent of Children Given More of Drink
Oralit	18.1	3.5
Strong tea	14.0	8.0
Herbal liquids	8.2	1.3
SSS	3.1	1.0
Milk	2.0	2.1
Regular tea	1.7	7.6
Water	1.7	9.1
Breast milk	1.4	11.3
	n=745	n=746

Summary

Mothers in our sample in West Java reported changes in the eating and drinking habits of their children when they had diarrhea. Among mothers who were still breastfeeding their child, 53 percent reported increasing breastfeeding during diarrhea and 15 percent reported reducing breastfeeding. Thus, the majority of mothers are correctly continuing breastfeeding during diarrhea.

However, it seems that children who were eating solid foods were likely to receive less nutrition during diarrhea. Seventy percent of mothers reported that their child ate less food than usual, primarily because the child lacked appetite. The majority of women (64 percent) gave their child their usual diet during

the time they had diarrhea. If the child was given special foods, the most frequently given special food was rice porridge, which could be less nutritious than their usual foods. Mothers were also likely to reduce or eliminate oily, spicy, or sour tasting foods when the child had diarrhea. More information is needed on the changes mothers make in feeding their children during diarrhea, particularly if their practices result in meals of lower nutritional value during diarrhea.

A majority of the mothers (61 percent) noted that their child was more thirsty during the last case of diarrhea. Forty-three percent reported giving their children special drinks during diarrhea (primarily Oralit, strong tea, and herbal liquids) and 39 percent said they gave more of certain drinks (most commonly breastmilk, water, and strong or regular tea). Sixteen percent of the mothers reduced or stopped giving iced syrup, sweet water or coconut water. Although a large proportion of mothers did seem to be giving a child more liquids during diarrhea, this is an area in which more emphasis could be given. Even children who aren't more thirsty during diarrhea should be given more liquids to help avoid dehydration.

What do mothers already know about Oralit?

A number of questions in the survey measured mothers' knowledge about Oralit and how to mix the formula. If a mother had ever prepared Oralit or if she said she knew how to make it, she was asked to mix it using packets provided by the interviewer.

Almost all mothers (99 percent) said they had heard of Oralit and most (98 percent) knew that it was a medicine for diarrhea. These are extremely high proportions and may reflect mothers' attempts to please the interviewer by responding positively to

questions. Only five mothers spontaneously said that Oralit replaces lost water.

Awareness of Oralit may be better measured by whether the mother has actually seen a packet. Thus, although most women said they had heard of Oralit, under 60 percent said they had actually seen the Oralit 200 packet when it was shown to them by the interviewer. Mothers in rural communities were significantly more likely to have seen the packet (62 percent) than mothers in the city (49 percent). Approximately two-thirds of the women who had heard of Oralit said they had used it, with no difference between urban and rural mothers in reported use.

It is very important that mothers know the correct formula for mixing Oralit for it to be effective. In Indonesia, the correct formula is one entire packet of Oralit mixed in one 200 ml glass of water.[14] Mothers who said they had previously made Oralit or who said they knew how to make it (82 percent of the sample) were asked to prepare Oralit. The interviewers observed the mothers while they mixed Oralit, then measured the volume of the solution prepared.

Overall, as can be seen in Table 11, only 44 percent of the mothers who mixed the Oralit prepared it correctly -- mixed the solution with the entire packet of salts and an acceptable volume of water (160-240 ml of water).[15] If one looks at all mothers in the sample, categorizing those who said they didn't know how to

[14]The instructions for use are to fill a belimbing glass (a standard 200 ml glass) with boiled and cooled water, to empty the entire packet of Oralit 200 into the glass, and stir the mixture with a spoon until it is completely mixed.

[15]These levels were determined to be acceptable by the staff of the Sub-Directorate of Diarrheal Disease Control.

mix Oralit as incorrect mixers, 37 percent of all the mothers in the four intervention regencies could correctly mix Oralit.

Table 11 shows significant differences in mixing between urban and rural mothers. Urban mothers were twice as likely as rural mothers to mix Oralit correctly.

If we look at the volumes of liquid and salts used in mixing the formula, we can see that mothers most often made a mistake with the liquid, 46 percent measuring amounts that were too small. Fifty-five percent of the rural mothers used too little liquid (less than 160 ml) compared to 27 percent of urban mothers. This volume could be dangerous to the child if the entire packet of salts was used, leading to a high concentration of sodium.

The errors in volume do not seem to be due to the use of a nonstandard glass to measure the liquid.[16] Forty-two percent of mothers who used a belimbing glass and 44 percent of mothers who used a "regular" glass measured less than 160 ml of liquid.

Overall, mothers made fewer errors in measuring the salts; 68 percent added the entire packet to the mixture. Almost 90 percent of urban mothers added the entire packet of salts, compared to 58 percent of rural mothers. Twenty-seven percent of rural mothers added less than half a packet to the liquid and 16 percent added more than one-half but less than a full packet.

[16]The majority (86 percent) of women who mixed the solution used a "regular" glass to measure the water. Only six percent used the recommended glass, a "belimbing" glass, which is a standard size. Eight percent of the mothers used glasses or containers of other sizes.

Table 11
Oralit Mixing Knowledge

	Total	Urban	Rural
Percent of all mothers who correctly mixed Oralit*	36.5 n=800	57.9 n=240	27.3 n=560
Mothers who mixed the formula			
Correct mixing*	43.7	66.2	33.4
Volume of liquid*			
Under 160 ml	46.0	27.4	54.5
160-199 ml	18.8	18.8	18.8
200 ml	28.5	46.2	20.4
201-240 ml	4.2	5.3	3.8
Over 240 ml	2.4	2.4	2.4
Amount of salts*			
Under 1/2 packet	19.4	3.4	26.8
More than 1/2 but less than 1 full packet	12.9	7.2	15.5
Entire packet	67.7	89.4	57.6
Temperature of liquid*			
Hot	20.2	14.9	22.6
Lukewarm	67.4	73.6	64.5
Cool	12.4	11.5	12.9
Stirred solution*	95.3	98.1	94.0
	n=659	n=208	n=451

*Urban/rural differences significant at $p<.05$.

A partial explanation for mothers measuring too little water is that they may have been trying to make less than a glassful of Oralit, perhaps to save some of the powder or because they wouldn't expect to give the child an entire glass of the solution at one time. Further analyses showed that mothers who mixed Oralit with less than 160 ml of liquid tended not to use the entire packet of salts (54 percent added less than an entire packet whereas from six to 11 percent of those who measured 160 ml or more used less than a full packet of salts).

The other side of this is that 46 percent of mothers who used under 160 ml of liquid did use the entire packet of salts, which could lead to a dangerous solution for the child.

Table 12 shows mixing knowledge for urban and rural women in the lowest 40 percent of monthly household expenditure, the middle 40 percent, and the highest 20 percent. Economic status made no difference in rural areas. Rural women in the low expenditure group were equally likely to have mixed the correct volume of liquid or salts as women in the high income group. However, there are significant and large differences between income levels of women in the urban areas in correct mixing and correct volume of liquid. Mothers in the urban low income group were much less likely to have correctly mixed Oralit than women in the middle and high income groups. Specifically, they were more likely to make an error in measuring the liquid, tending to measure too little. Poor urban women tended to look more like rural women in their mixing behavior.

Other mistakes made by mothers were not as widespread or as serious. Six percent of the rural mothers didn't stir the mixture, which could lead to a weak and less effective solution. Twenty-three percent of rural mothers and 15 percent of urban mothers used very hot water (glass is too hot to hold) to make

Table 12
Mixing Knowledge for Different Economic Groups

	Urban			Rural		
	Low	Middle	High	Low	Middle	High
Correct mixing	38.5	70.6	69.7*	33.5	30.4	45.2
Volume of Liquid:						
< 160 ml	53.8	22.6	24.5*	56.4	53.3	50.0
160-199 ml	7.7	25.0	16.3	20.0	17.6	19.0
200 ml	34.6	42.9	52.0	19.1	20.9	23.8
201-240 ml	3.8	7.1	4.1	4.4	3.3	2.4
>24 ml	0	2.4	3.1	0	4.9	4.8
Volume of salts:						
<1/2 pack	0	3.6	4.1	30.7	24.7	14.3
1/2<1 pack	15.4	10.7	2.0	15.1	15.9	16.7
1 packet	84.6	85.7	93.9	54.2	59.3	69.0
	n=26	n=85	n=99	n=230	n=184	n=42

*Differences between income groups significant at p<.05.

the solution instead of using water that had cooled enough to allow the child to drink it immediately.

Overall, we found a low level of knowledge about how to correctly mix Oralit, particularly among rural women, who should be special targets of education activities. An examination of women of different economic groups suggested that, in the cities, poorer women (who also tend to be less educated) should also be targeted in the communication efforts.

More information is required to understand why mothers who said that they had made Oralit before or who said they knew how to make it mixed Oralit incorrectly. It may be that they actually

didn't know how to make the solution, but were guessing to try to please the interviewers. In these cases, rural mothers and poorer mothers in the cities may have made more mistakes in mixing because they tended to have less education and perhaps could not read the packet instructions as well as wealthier urban mothers could. This suggests more education in Oralit mixing is required and that communication programs attempting to teach mothers correct mixing should develop messages that target mothers in rural areas and in poorer sections of the cities. However, there is also the possibility that mothers were deliberately trying to make a partial mixture of the solution (e.g., half a glass). This could be examined through in-depth interviews.

What communication channels are most appropriate to reach the audience?

Here we wanted to look at how much access (or potential exposure) mothers had to the different communication channels available in West Java and how much they used these channels. We looked at mass media and interpersonal channels.

Mass Media Channels

In the survey the mothers were asked a number of questions about radio ownership and listening, television ownership and watching, reading ability and use of print media. The results from these questions are presented in Table 14.

Radio access is good. Over half the mothers in the sample said they had a radio in their household. However, over three-quarters of all mothers said they listened to the radio, indicating that women listen to the radio in places other than their own home. Overall, mothers who listened at all reported

Table 14
Access and Use of Mass Media Channels
among Mothers in the Four Intervention Regencies

	All Mothers	Urban Mothers	Rural Mothers
Radio in Household*	56.5	72.9	49.5
Listens to Radio	76.9	80.4	75.4
Mean Number of Days/Week Listen (Listeners Only)*	5.8 (n=615)	6.1 (n=193)	5.7 (n=422)
TV in Household*	32.9	65.8	18.8
Watches TV*	61.9	88.8	50.4
Mean Number of Days/Week Watches (TV Watchers Only)*	4.7 (n=485)	5.8 (n=212)	3.8 (n=273)
Mother Has 5 or More Years of Education*	70.3	83.8	64.5
Read Newspaper Yesterday*	9.3	23.8	3.0
Read Magazine in Last Two Weeks*	15.3	33.1	7.7
Has Attended Mobile Film	31.7	32.1	31.5
	n=800	n=240	n=560

*Urban/rural difference significant at p<.05.

listening almost every day (the average number of days a week a mother listened is 5.8).

We also compared radio access and exposure between urban and rural mothers, and between mothers of different economic groups. As can be seen in the table, urban mothers were significantly

more likely to have a radio in their household than rural mothers (as we also found with mothers in higher economic groups). However, there was no significant difference in listening to the radio at all, and only a small difference in number of days a week mothers reported listening. This suggests that radio is potentially a good channel for reaching all mothers, urban or rural, wealthier or poorer, with information.

However, we found that, although the majority of mothers listened to the radio, they listened to a large number of stations and the stations they chose differed significantly between urban and rural mothers. We asked mothers to name the two stations to which they listened most frequently. Mothers named over fifty stations and no station attracted a majority of mothers. The station most frequently named was Antares (24 percent), followed by Galuh (10 percent), and Sinta Buana (10 percent). Table 15 shows the most frequently named stations compared by urban and rural residence. We also looked at differences between economic groups, but any differences were explained by urban/rural residence.

Urban and rural mothers in the four intervention areas tended to listen to different stations. Thus a program that wants to reach both groups of mothers would have to use a mix of stations. Rural mothers were most likely to listen to Antares (31 percent), followed by Galuh (12 percent) and Rex and Galunggung (both 11 percent). Urban women were more likely to listen to Garuda (19 percent), Sinta Buana (18 percent), Antares and Dahlia (both nine percent).

Mothers were asked at what times of day they listened to the radio and the time they most frequently listened. As can be seen in Table 16, the most common times that mothers reported listening were between 4 and 6 p.m. (46 percent), between 2 and 4

Table 15
Radio Stations Named by Women in the
Four Intervention Regencies

	Total	Urban	Rural
Antares	24.2	9.3	31.0*
Galuh	10.1	6.7	11.6
Sinta Buana	10.1	17.6	6.6*
Garuda	9.1	19.2	4.5*
Rex	8.6	3.1	11.1*
Galunggung	7.6	0	11.1*
Lita	7.5	4.7	8.8
RRI Bandung	6.8	5.2	7.6
Sturada	6.0	4.1	6.9
Esterlita	5.7	7.8	4.7
Dahlia	5.2	9.3	3.3*
Sangkuriang	3.9	8.8	1.7*
Mayapada	3.6	0	5.2*
MBC	3.4	1.6	4.3*
Faksi	3.4	8.3	1.2*
Paramuda	3.3	7.8	1.2*
Ganesha	3.3	8.3	.9*
	n=615	n=193	n=422

*Difference between urban and rural mothers is significant at p<.05.

Table 16
Radio Listening Times for Women in the Four Intervention Regencies

	Sometimes Listen			Listen Most*		
	Total	Urban	Rural	Total	Urban	Rural
Before 6 a.m.	27.8	27.5	28.0	7.2	5.7	7.8
6-8 a.m.	25.0	29.0	28.0	11.4	11.4	4.5
8-10 a.m.	29.8	39.4	25.4*	13.8	18.1	11.8
10 a.m.-12 p.m.	34.0	29.5	36.0	18.7	14.0	20.9
12-2 p.m.	24.2	30.6	21.3*	8.8	13.0	6.9
2-4 p.m.	39.5	45.1	37.0	17.1	19.2	16.1
4-6 p.m.	45.9	43.5	46.9	17.2	11.4	19.9
6-8 p.m.	28.6	24.4	30.6	7.8	4.7	9.2
8-10 p.m.	15.6	13.0	16.8	2.6	2.1	2.8
After 10 p.m.	1.3	1.6	1.2	.2	.5	0
	n=615	n=193	n=422	n=615	n=193	n=422

*Urban/rural difference significant at $p<.05$. Mothers could list many times when asked when they sometimes listen, but only one time that they listened most.

p.m. (40 percent), and between 10 a.m. and 12 noon (34 percent). Urban mothers were also likely to listen sometimes between 8 and 10 a.m. and between noon and 2 p.m., but generally differences between urban and rural mothers were not significant. No significant differences between economic groups were found.

The times of day mothers reported listening most often were between 10 a.m. and 12 noon and between 2 and 6 p.m. There were significant differences between urban and rural mothers. Rural mothers reported listening most often in the late morning (10

a.m. to 12 noon) and the late afternoon (4 to 6 p.m.). Urban mothers reported listening most often in mid-afternoon (2 to 4 p.m.) and mid-morning (8 to 10 a.m.). These figures suggest that radio spots may have to be scheduled at different times for rural and urban mothers in order to reach their largest audience.

Radio messages will need to be frequent and to be broadcast on a number of different stations in order to reach a large number of women in the four intervention areas of West Java. The radio stations which reach the largest numbers of women are Antares Galuh, Rex, and Galunggung, however they were used differentially by urban and rural women. The best times of day to reach the largest number of mothers seem to be between 2:00 and 6:00 p.m. and between 10:00 and 12:00 a.m.

Television is another communication channel available in West Java. Approximately one-third of all mothers said they had a television in their home and slightly over 60 percent said they watched television (refer back to Table 14). This seems to suggest that television could potentially reach a large percentage of mothers in the four regencies, as there is only one broadcast television channel that can be received in West Java.

There are significant and large differences in television watching between urban and rural mothers and between mothers of different economic levels. Mothers in urban areas and mothers in the upper 60 percent of monthly per capita expenditures were much more likely to have access to a television, to watch it, and to watch it more frequently than rural and poor mothers. If television were chosen as a channel, it is likely that many of the most needy mothers would not be reached.

Mobile films could be another way to reach mothers. However, only one-third of mothers reported ever seeing a mobile film,

with no significant difference between urban/rural or economic groups. It is hard to determine whether this would be an appropriate channel because we don't know how frequently mothers had seen these films. Mobile films may not be an appropriate channel for wide dissemination of ORT information because they are seen by a minority of women and because they are probably not seen on a frequent or regular basis.

Print materials could be used as another source of information for mothers. Although the majority of mothers in the sample said they could read (90 percent), this seems to be a high estimate. As seen in Table 14, 70 percent of all the mothers in the sample had five or more years of education and could be expected to have some reading ability. It is likely that the other 30 percent could not read or could not read well.

Mothers in rural areas had significantly less education than mothers in urban areas (65 percent of rural mothers had five or more years of schooling compared to 84 percent of urban mothers). Mothers in lower income groups in both urban and rural areas had less education than mothers in wealthier families. Sixty percent of mothers in the low income group, 30 percent of mothers in the middle income group, and 11 percent in the high income group had less than five years of education. This suggests that materials developed for rural women and low income women should take into consideration that their audience may have trouble reading.

Few women reported reading newspapers or magazines, and there were large differences between urban and rural women. Twenty-four percent of urban women said they had read a newspaper the day before and 33 percent said they had read a magazine in the last two weeks. However, only three percent of rural mothers reported reading a newspaper and eight percent reported reading a magazine.

Print materials of some kind would be appropriate for disseminating information to mothers in West Java. However, the established print media (newspapers and magazines) would not reach many mothers, especially in the rural areas and those of low economic status. Instead, other print materials such as pictorial flyers handed out to mothers at the village level, or perhaps posters, would be more appropriate. In addition, some attention should be paid to making the print materials as simple as possible so that rural and poorer women have a greater chance of understanding them.

Interpersonal Channels

Mothers were asked about four possible interpersonal sources of health information -- the health center, health post, health volunteers, and retail outlets. Table 17 shows the percentage of women who reported going to the four sources. Overall, the data indicate that the majority of mothers in our sample did not go regularly or frequently to any of the medical facilities or personnel available.

Twenty-one percent of the mothers reported going to a health center in the last month and approximately 70 percent said they had been in the last six months. Mothers in rural areas were slightly more likely to have been to a health center than mothers in urban areas (who may use private doctors instead).

Twenty-four percent of the women reported that they had been to a health post (Posyandu)[17] in the last month, and 65 percent said

[17]The Posyandu, or integrated health post, system was developed in 1984 to provide free health services for young children and their mothers in their villages one day a month. Services provided include weighing and growth monitoring, Vitamin A capsules, Oralit, iron tablets and tetanus shots for pregnant women, family planning advice, referrals, and health education. The health posts are manned by health professionals and village

Table 17
Mothers' Reported Use of Interpersonal Sources

	Total	Urban	Rural
Went to health center*			
In last month	20.9	19.2	21.7
In last 2-6 months	48.0	46.7	48.6
> than 6 months ago	23.4	21.7	24.2
Never	7.6	12.5	5.6
Went to health post*			
In last month	23.6	21.7	24.5
In last 2-6 months	41.9	48.3	39.1
> than 6 months ago	11.1	7.5	12.7
Never	23.4	22.5	23.8
Ever heard of health post*	91.9	97.1	89.6
Went to volunteer			
In last month	21.9	20.8	22.3
In last 2-6 months	14.9	15.0	14.8
> than 6 months ago	2.9	1.7	3.4
Never	60.4	62.5	59.5
Ever heard term "Kader Kesehatan"*	56.4	62.9	53.6
Went to shop/drugstore			
In last month	65.3	64.9	65.5
In last 2-6 months	29.4	30.5	28.9
> than 6 months ago	3.8	3.3	3.9
Never	1.5	1.3	1.6

*Urban/rural differences significant at $p<.05$.

they had been in the last six months. Although the health posts are presumably held every month, the majority of mothers did not seem to attend them on a monthly basis.

volunteers (kaders)

Mothers were less likely to report visiting a health volunteer than the health center or health post. Although 22 percent said they had been to a health volunteer in the last month, overall, only 40 percent of the mothers said they had ever been to visit a health volunteer, with no significant difference between urban and rural mothers. This may partly be a problem of awareness of the volunteers or recognition of the term "Kader Kesehatan" (health volunteer). Forty-four percent of the mothers said they had never heard of the health volunteers. We don't know if mothers were not aware of the volunteers because there was no active volunteer in their community (volunteer dropout is estimated at 50 percent in the first year[18]), because they weren't aware that there is such a person in their village, or because they didn't associate the term "Kader Kesehatan" with the volunteer in their village.

Almost all mothers said they had been to a shop, medicine shop, drug store or pharmacy, and the majority had been in the last month.

We then asked mothers if they had ever heard or seen any information about the treatment of diarrhea at each of these sources. Overall, slightly under half the mothers who said they had been to a health center or health post reported ever having heard information about diarrhea at that location. Fifty-seven percent of mothers who reported visiting a volunteer said they had ever received information about diarrhea. Very few mothers (seven percent) reported hearing any information about diarrhea in a shop. The data indicate that approximately half the mothers had at least once been given information by the health professionals (but we don't know how frequently information was

[18]Judd, M. "Kaders in Indonesia." Prepared for the U.S. Agency for International Development, Jakarta, Indonesia, January 1987.

given), but that shopkeepers generally were not disseminators of information about treatment of diarrhea.

The same pattern was found among mothers who said they knew how to make Oralit. Mothers reported learning how to make Oralit from a wide variety of sources (see Table 18). Those most frequently named were the health center (22 percent), the health volunteers (21 percent), the health post (20 percent), friends or neighbors (19 percent), and the label on the Oralit packet itself (11.5 percent). There were significant differences between urban and rural mothers in some of the locations where they learned to make Oralit. Urban mothers were significantly more likely than rural mothers to have learned to make Oralit from the packet label, from a doctor or from the television, probably because they were more likely to be able to read, to go to doctors, and to own and watch television sets. Rural mothers were significantly more likely than urban mothers to say they had learned at the health center, from a nurse or from the head of the village.

In summary, mothers in West Java reported some contact with a variety of potential sources of information about diarrhea. However, no one government facility or person was seen by a majority of the mothers with any frequency -- approximately equal proportions of mothers (one-quarter) said they had visited a health center, health post, or health volunteer in the last month. Government health personnel were already providing some information about diarrhea and about Oralit, but we have to question how many women they reached with information and how often.

Because of their limited use by mothers, health workers at the health centers and health posts and volunteers may not be the best channel to reach a large number of mothers with information

Table 18
Source of Information about Oralit among Mothers in the Four Intervention Regencies

	Total	Urban	Rural
Learned to make Oralit from:**			
Health center	22.2	14.8	25.5*
Volunteer	20.5	16.7	22.3
Health post	19.5	23.3	17.7
Friend/neighbor	18.6	19.0	18.3
Oralit label	11.5	19.5	7.9
Nurse	9.7	5.7	11.6*
Head of village or section	7.6	4.3	7.9*
Doctor	7.2	13.3	4.4*
Relative	6.7	7.1	6.6
Television	4.6	11.9	1.3*
Radio	3.0	3.3	2.8
Shop/drugstore	1.2	1.9	.9
	n=668	n=210	n=458

*Difference between urban and rural mothers significant at $p<.05$.
** Percentages add up to more than 100 percent because mothers could give more than one response.

about diarrhea or with Oralit packets. However, mothers in both rural and urban areas did have some contact with these groups and had obtained information about diarrhea treatment. Government health personnel should only be one channel in a multi-channel program. No one group (health center, health post, or volunteer) seemed to reach a majority of mothers, thus it will be important to train all levels in the health services in correct management

of diarrhea so they can pass on the correct information to mothers.

Mothers were not asked about their recent contact with private doctors, nurses, or midwives. However, when they were asked about treatment of diarrhea, many had said they took the child to one of these medical personnel, particularly in the urban areas. Private doctors, nurses, and midwives should be included as another channel in an ORT intervention. As discussed in an earlier part of the report, the practice of giving drugs for diarrhea by government and private health workers should also be understood and addressed in any program using these people as sources of information and Oralit.

Women reported higher contact with local shopkeepers (65 percent in the last month). However, as there had been no official training of retailers, it is not surprising that retailers were reported to rarely give mothers information about treatment of diarrhea. Local shops could be a reliable source of Oralit packets. Whether shopkeepers would be willing to promote Oralit with the other drugs they provide to mothers or to take the time to provide information to mothers in how to mix and administer Oralit and when to use it are questions that should be carefully considered. If retailers were to be used as a source of information or of Oralit packets, they would need to be carefully trained and supervised.

SUMMARY AND CONCLUSIONS

This report presents the data from the baseline survey carried out for the HEALTHCOM project in West Java in February and March, 1988. One thousand women from the four intensification regencies (Garut, Tasik Malaya, rural Bandung, and the city of Bandung) and

one control regency (Subang) were interviewed. Because of differences between the control area and the intensification areas the control interviews were not included in these analyses. Thus, the data here report on the 800 interviews carried out with the mothers in the four intervention areas.

This report examined six questions about mothers' knowledge about and behavior in treating their young children's diarrhea. These data will serve as a baseline against which to measure the impact of activities taking place in 1988 and 1989, but were also used to provide information to help in developing the communication intervention. The data addressing each question, well as the implications for a communication intervention, are summarized below.

What is the Incidence of Diarrhea among Children under Five Years Old in the Sample?

Twenty-three percent of the mothers reported having a child with diarrhea within the month prior to the interview and 71 percent had a child with diarrhea more than a month before. Only seven percent reported that none of their children under five had ever had diarrhea.

We found no significant differences in incidence of diarrhea by socioeconomic status or by whether the family lived in a city or rural area. This suggests that no specific group of mothers has higher prevalence of diarrhea in their children than another and that targeting mothers with higher rates of diarrhea in their children will not be necessary. All mothers are potential target groups based on diarrheal incidence figures.

What symptoms lead a mother to decide that a case of diarrhea is serious and what symptoms are cues for treatment of the case?

Loss of appetite, less playing, and increased thirst are signs that could be used as cues that some kind of treatment is required (but that the child is only a little bit sick). Vomiting and blood in the stool seem to tell the mother that the diarrhea is serious and needs special treatment. These two signs could be used in health education messages as cues for the mother to take the child for treatment.

What treatments are currently being given for diarrhea?

Overall, we found a high level of treatment of diarrhea cases among mothers in the four regencies in the sample. Eighty-seven percent of the last case of diarrhea reportedly were given some kind of treatment -- 75 percent were treated at home and 51 percent were taken outside the home for treatment (primarily to a health center, doctor, or nurse).

Oralit was given in a minority of cases of diarrhea treated at home or taken for treatment. The most common home treatments were over-the-counter pills (48 percent), Oralit (25 percent), herbal liquids (19 percent), and medicinal rubs (15 percent). Children who were taken outside the home for treatment were most likely to be given pills (54 percent), antibiotic syrups (45 percent), and Oralit to take home (26 percent). Many received more than one remedy for diarrhea.

Source of treatment was significantly related to the remedy given: children who were taken to medical professionals (health center, hospital, doctor, or nurse) were likely to be given pills and syrups. Almost all of the very few children said to have been taken to a health post or volunteer (12 children or three percent of the cases) were given Oralit . The other source most

likely to give Oralit as a remedy was the health center or hospital -- 33 percent of children who were taken were given Oralit packets to take home.

Generally mothers were not given the recommended amounts of Oralit packets. In cases where Oralit packets were given to the mother, only 18 percent of mothers received the number of packets recommended (five). Over half the mothers received only one or two packets. We don't know whether this is because the health workers don't have enough packets to distribute five at a time, which would indicate that packet distribution needs to be addressed, or if the health workers feel it is only necessary to give the mother one or two packets, which would indicate that this information could be stressed in training programs.

The availability and use of drugs among mothers and health professionals may be barriers to increasing the use of Oralit in rural West Java. If mothers are accustomed to buying anti-diarrheals at the shops or to being given drugs by their health worker or doctor, they may not be willing to use Oralit, particularly if they can see no immediate benefits. It is important to understand mothers' goals in treating diarrhea, their time constraints, and their perceptions of ORT in developing an information program to promote oral rehydration solution.

Health professionals (private doctors and nurses and health workers at the health centers) seem to give a higher level of drugs for diarrhea cases than is recommended by the Ministry of Health. We don't know if this is due to their own beliefs about how a case should be treated, or if they give mothers drugs because the mothers expect or ask for them. More research is needed to understand why mothers and health workers currently give children drugs for diarrhea. Policies and practices in the

use of drugs also will have to be considered in trying to expand the use of oral rehydration solutions in West Java.

How are mothers currently feeding their children when they have diarrhea?

Mothers in our sample in West Java reported changes in the eating and drinking habits of their children when they had diarrhea. Among mothers who were still breastfeeding, 53 percent reported increasing breastfeeding during diarrhea and 15 percent reported reducing breastfeeding. Thus, the majority of mothers were correctly continuing breastfeeding during diarrhea.

However, it seems that children who were being given solids were likely to receive less nutrition during diarrhea. Seventy percent of mothers reported that their child ate less food than usual, primarily because the child lacked appetite. The majority of women (64 percent) gave their child their usual diet during the time they had diarrhea. The most frequently given special food was rice porridge, which could be less nutritious than their usual foods. Mothers were also likely to reduce or eliminate oily, spicy, or sour tasting foods when the child had diarrhea. More information is needed on the changes mothers make in feeding their children during diarrhea, particularly if their practices result in meals of lower nutritional value during diarrhea.

A majority of the mothers (61 percent) noted that their child was more thirsty during the last case of diarrhea. Forty-three percent reported giving their children special drinks during diarrhea (primarily Oralit, strong tea, and herbal liquids) and 39 percent said they gave more of certain drinks (most commonly breast milk, water, and strong or regular tea). Although a large proportion of mothers did seem to give a child more liquids during diarrhea, this is an area in which more emphasis could be

given. Even children who aren't more thirsty during diarrhea should be given more liquids to help avoid dehydration.

What do mothers already know about Oralit?

Overall, we found a low level of knowledge about how to correctly mix Oralit; only 44 percent of those who mixed the solution (and 37 percent of the entire sample) mixed Oralit with the correct volumes of liquid and salts. Urban women were twice as likely to correctly mix Oralit as rural women, who should be special targets of education activities. In the cities, poorer women (who also tend to be less educated) should also be targeted in the communication efforts. The most common mistake in Oralit mixing was in measuring the water -- 46 percent of those who mixed the solution used too little water (under 160 ml).

Teaching mothers correct mixing of Oralit should be an important part of the communication intervention. Communication programs attempting to teach mothers correct mixing should develop messages that target mothers in rural areas and in poorer sections of the cities. In addition, it would be useful to understand why mothers who said that they had made Oralit before or who said they knew how to make it mixed Oralit incorrectly. It may be that they actually didn't know how to make the solution, but were guessing to try to please the interviewers. In these cases, rural mothers and poorer mothers in the cities may have made more mistakes in mixing because they tended to have less education and perhaps could not read the packet instructions as well as wealthier urban mothers. However, there is also the possibility that mothers were deliberately trying to make a partial mixture of the solution (e.g., half a glass). This could be examined through in-depth interviews.

What communication channels are most appropriate to reach the audience?

Radio messages will need to be frequent and to be broadcast on a number of different stations in order to reach a large number of women in the four intervention areas of West Java. The radio stations which reached the largest numbers of women were Antares Galuh, Rex, and Galunggung, however they were used differentially by urban and rural women. The best times of day to reach the largest number of mothers seem to be between 2:00 and 6:00 p.m. and between 10:00 and 12:00 a.m.

Television is another communication channel available in West Java. Approximately one-third of all mothers said they had a television in their home and slightly over 60 percent said they watch television. This indicates that television could potentially reach a large percentage of mothers in the four regencies, particularly as there is only one broadcast television channel that can be received in West Java.

However, there are significant and large differences between urban and rural mothers and between mothers of different economic levels. Mothers in urban areas and mothers in the upper 60 percent of monthly per capita expenditures were much more likely to have access to a television, to watch it, and to watch it more frequently than rural and poor mothers. If television were chosen as a channel, it is likely that many of the most needy mothers would not be reached.

Only one-third of mothers reported ever seeing a mobile film, with no significant difference between urban/rural or economic groups. It is hard to determine whether this would be an appropriate channel as we don't know how frequently mothers had seen these films. Mobile films may not be an appropriate channel

for wide dissemination of ORT information because they were seen by a minority of women and because they were probably not seen on a frequent or regular basis.

Print materials of some kind would be appropriate for disseminating information to mothers in West Java. However, the established print media (newspapers and magazines) would not reach many mothers, especially in the rural areas and those of low economic status. Instead, other print materials such as pictorial flyers handed out to mothers at the village level, or perhaps posters, would be more appropriate if current distribution systems reach all women. In addition, some attention should be paid to making the print materials as simple as possible so that rural and poorer women have a greater chance of understanding them.

Government health personnel (at the health centers or health posts and volunteers) may not be the best channel to reach a large number of mothers with information about diarrhea or with Oralit packets. They should only be one channel in a multi-channel program. No one government facility or person was seen by a majority of the mothers with any frequency -- approximately one-quarter of mothers said they had visited a health center in the last month, one-quarter said they had been to a health post in the last month, and around one-quarter said they had seen a health volunteer in the last month.

However, mothers in both rural and urban areas did have some contact with these groups and had obtained information about diarrhea treatment, although we have to question how many women were reached with information and how often. The data suggest that a comprehensive ORT program needs to train government health professionals at all levels in correct treatment of diarrhea and use of ORT. However, the program should also address private

doctors and nurses, who are potential sources of information and Oralit, particularly in the urban areas of West Java.

Women reported higher contact with local shopkeepers (65 percent in the last month). However, not surprisingly, retailers were reported to rarely give mothers information about treatment of diarrhea. Local shops could be a reliable source of Oralit packets. Whether they would be willing to promote Oralit with the other drugs they provide to mothers or to provide training to mothers in how to mix and administer Oralit and when to use it are questions that should be carefully considered. If retailers were to be used as a source of information or Oralit, they would need to be carefully trained and supervised.

The current policy in West Java is to rely heavily on village volunteers to provide mothers with Oralit packets and to train them in correct treatment of diarrhea cases, either in their homes or at the health post. The data show that, although health volunteers were highly likely to prescribe oral rehydration solution, they were rarely visited when a child has diarrhea. This would suggest that, unless mothers can be motivated to take their children to volunteers for diarrhea cases or the volunteers can be motivated to seek out mothers to give them packets and training, this channel may not be the best way to reach mothers.