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Evaluation study of a pilot project in community based growth monitoring and nutrition education in South Kordofan Province.

by

Richard M. Lockwood, INCS Consultant

**Prepared by Education Development Center, Inc.
55 Chapel Street, Newton, MA 02160 USA**

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INTRODUCTION

The nutrition component of primary health care systems is one of the most difficult to build. For three years now the International Nutrition Communication Service (INCS) has been helping the Ministry of Health in the Sudan, UNICEF and USAID design a pilot community based nutrition education growth monitoring system in South Kordofan Province. INCS consultant Dr. Richard Lockwood visited Sudan in 1981 and helped set up the pilot project which began in twelve villages.

Two years later Dr. Lockwood returned to evaluate the effectiveness of the program and, based on what he found, helped to design the project's next phase. What Dr. Lockwood did find was a system that, despite problems, appeared to be working. Illiterate primary health care workers in ten villages were weighing and measuring children and monitoring infant growth-- and in half the villages combining nutritional assessment with education for mothers on what to feed their babies if they weren't growing properly.

The next stage of the Project involves expanding nutritional surveillance efforts to an additional 15 villages in South Kordofan and 15 villages in North Kordofan. In a year's time Dr. Lockwood will return again for another assessment visit; and hopefully to help the MOH expand what began two years ago in twelve villages into a major component of a national primary health care program.

Ronald C. Israel, Director
International Nutrition
Communication Service

January, 1984

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My Sudanese colleagues, Ihsan Mustafa and Ihsan Hassan from Khartoum, and Mohammed Jabir and Sadia Kowa Hussein from Kadugli, gave me the professional support that permitted the evaluation study to run smoothly.

RECOMMENDATIONS

1. Community Health Workers (CHW) should continue to be responsible for growth monitoring activities. Village mid-wives and traditional birth attendants should report births in the village to the CHW but should not weigh the infants.
2. The UNICEF produced growth chart must be standardized in color and format in coordination with those being produced by the Maternal Child Health Division so that mothers can readily identify the growth chart card.
3. A separate card with a different color should be kept by the mothers as an immunization record.
4. The growth monitoring activities should be expanded to an additional 15 villages in South Kordofan and 15 villages in North Kordofan.
5. The Salter Scales have proved to be the most accurate and durable measuring instrument and additional scales should be purchased.
6. Monthly weighing sessions should be called for in advance by notifying mothers who come for curative care during the normal work week.
7. Monthly weighing sessions should be exclusively for weighing and growth monitoring and not include dispensing of medicines.
8. "At risk" children should be visited by the Community Health Worker in the child's home and weighed again at that time on a weekly basis.
9. The Senior Medical Assistant must be given a vehicle, driver, and fuel, to be able to supervise regularly on a monthly basis each Community Health Worker.

BACKGROUND

In 1981, the consultant was invited by UNICEF, through an AID funded contract, "to develop a community based nutrition surveillance methodology within the framework of the Primary Health Care Program in Kadugli and Dilling Districts of the South Kordofan Province."

Based on the consultant's report, a pilot project was started in 12 villages in two districts of the South Kordofan Province which included growth monitoring activities between the Community Health Workers and the mothers, nutrition education activities for mothers with emphasis on breast-feeding, oral rehydration therapy for children with acute cases of diarrhea, and the introduction of proper weaning foods.

In August of 1982, a training program was carried out (Appendix 1) to train Community Health Workers and Village Midwives in recognizing clinical signs of malnutrition, proposing appropriate infant feeding practices, preventing dehydration, monitoring growth by weighing children, recording their weight on a growth chart, and interpreting growth patterns. The training course was conducted by Nutritionists from the Nutrition Division of the Ministry of Health in Khartoum and funded by UNICEF.

A field trip was taken by the UNICEF Nutrition Officer in November of 1982 to monitor the progress of the Pilot Project.

This consultant was invited to return to South Kordofan in November of 1983 based on the following terms of reference:

1. To prepare a draft design of the evaluation study of the Pilot Project of Growth Monitoring and Nutrition Education prior to his visit to the Sudan and finalize the same during the first 10 days in consultation with the

Nutrition Division, Ministry of Health, Khartoum.

2. To conduct the training of supervisors of enumerators and interviewers.
3. To supervise the evaluation study.
4. To process data and information collected during the study and analyze it.
5. To submit the final report on the above evaluation study within 30 days.

EVALUATION

Design

To evaluate the effectiveness of the training program on growth monitoring and nutrition education, it was necessary to divide the indicators into two categories: process indicators--activities or services delivered, which if implemented would achieve the stated objective of better infant and child health and growth, and output indicators--the expected results from the training and services.

In this case, the process indicators would be the delivery of information from the training program, the distribution of oral rehydration salts, the use of weighing scales, and growth charts. The output indicators would be the knowledge gained from the services of the Community Health Workers to the mothers, the understanding and use of ORS and the growth charts, and the appropriate feeding of infants and preschool children during normal growth and episodes of pathological stress. Finally, the actual nutritional status as measured by anthropometry (weight-for-age as percent of standard) would be the ultimate measurement of achievement of the overall objective, normal child growth.

Experimental Case Study

Group 1 (5 villages)	Treatment (CHW training) —————>	Measurement (Experimental Group)
Group 2 (5 villages)	(no training) —————>	Measurement (Control Group)

Selection of Sites

Group 1 represents five villages where Community Health Workers received training in growth monitoring, nutrition education, and use of oral rehydration salts. Group 2 represents 5 villages where the Community Health Workers did not receive any scales, growth charts, or training in growth monitoring.

Ordinarily, this experimental design should permit generalizations to a greater population. However, neither the villages nor the mothers were randomly selected. The villages were selected by the Health Officer of South Kordofan, and the Senior Medical Assistant of Kadugli and Dilling districts based on the following village profile:

1. Population size
2. Number of families
3. Principal occupation
4. Source of water
5. Principal tribe
6. Socio-economic level

Extraneous Variables:

7. Any recent droughts
8. Any recent epidemics
9. Price of staple foods

Tables 1 - 2 give a description of the 10 villages. Three of these villages were included in the Progress Report by the UNICEF Nutrition Officer in March, 1983. The five control villages were selected from among thirty and were within 2 hours ride by landrover from the District capital of Kadugli.

Selection of Sample

The original evaluation design included the interviewing of the Community Health Worker, the Village Midwife (who does not necessarily live in the village), and 15 mothers from each village, as well as weighing the youngest children of these mothers.

Only one village, El Efein from the experimental group, knew in advance, of the arrival of the evaluation team. There was both an advantage and a disadvantage in not being able to notify in advance. The advantage is to eliminate "the Hawthorne Effect" or a tendency for a bias in response because of advanced preparation. The

Table 1

VILLAGE PROFILE: EXPERIMENTAL GROUP

<u>Village:</u>	<u>El Efein</u>	<u>Bilinga</u>	<u>Kega Tamero</u>	<u>El Kweik</u>	<u>Ankarko</u>
population:	1643	4500	7500	?	4000
Families:	240	800	2000	200	192?
Occupation:	farmers	farmers	farmers	farmers	farmers
Water Source:	Spring wells	UNICEF wells	Spring & UNICEF well	UNICEF well	UNICEF well
Price of food:	expensive	medium	cheap	medium	cheap
Drought:	yes	no	no	yes	no
Major diseases:	malaria diarrhea wounds	whooping cough measles	diarrhea wounds malaria	malaria chest.inf.	diarrhea
Tribe:	Nuba/Arab	Nuba	Nuba/Arab	Nuba/Arab	Nuba/Arab
Socio-economic status:	poor	poor	poor	medium	poor

Table 2

VILLAGE PROFILE: CONTROL GROUP

Village:	<u>Abu Safifa</u>	<u>Taysee Abdel Salaam</u>	<u>Heija Al Ful</u>	<u>Shororo</u>	<u>Abu Snoon</u>
Population:	4700	5000	3600	?	?
Families:	1600	300?	?	?	?
Occupation:	farmers	farmers	farmers	farmers	farmers
Water Source:	Spring wells	spring wells	wells hafir	?	spring wells
Price of food:	medium	expensive	expensive	expensive	expensive
Drought:	no	no	no	no	no
Major diseases:	malaria diarrhea	whooping cough diarrhea	malaria diarrhea resp. inf.		malaria diarrhea wounds
Tribe:	Nuba/Arab	Nuba	Nuba/Arab	Nuba	Nuba
Socio-economic status:	medium	poor	poor	poor	poor

disadvantage is that there is always the possibility that the Community Health Worker may not be there, when the evaluation team arrives, as in 3 villages in this study.

The 15 mothers in each village were not randomly selected. We asked the Community Health Worker to notify the mothers who lived nearby to come for interviewing and to bring their youngest children and the growth charts. In both the control and experimental groups, the proximity to the health post should mean a better health status of the children in comparison to the rest of the community, but should not bias the results between groups, since the sampling was the same. But generalizations to larger populations are restricted.

Methods

A questionnaire was developed in Khartoum by the consultant and two nutritionists from the Nutrition Division of the Ministry of Health. It was translated into Arabic, and then asked to be translated back into English to make sure that the translation did not lose the meaning of the original questions. Subjects such as growth monitoring, infant feeding practices, oral rehydration, were asked similarly to Community Health Workers, Village Midwives and mothers. Additional questions were asked to the Community Health Worker and Village Midwife on workload, satisfaction of salary, and to the mothers on recognition of activities by the CHW.

Weighing of children was done by standard techniques under field conditions (Jelliffe, 1966) using the Salter Scale. The children in the control villages, where scales were not available, were weighed by a Salter Scale provided by the Senior Medical Assistant from Kadugli.

Reference standards of weight-for-age were based on the Harvard Standards (sexes combined). The Gomez Classification was used to classify nutritional status into four categories based on the following cut-off points:

Table 3

PROFILE OF COMMUNITY HEALTH WORKERS

	CONTROL				EXPERIMENTAL					
	Village: Abu Snoon	Shororo	Beija Al Ful Taysee	Abu Abdel Safifa Salaam	El Efein	Bilinga	El Kweik	Kega Tamero	Ankarko	
Age:	28	Absent	28	Absent	24	25	23	23	Absent	23
Marital Status:	married		married		married	single	single	single		married
Formal Educ.:	yes		yes		yes	yes	yes	yes		yes
Sends reports:	yes		yes		yes	yes	yes	yes		yes
Salary requested:	90 Sudanese pounds		100		100	100	80	120		100
Knows ORS:	yes		no		yes	yes	yes	yes		yes
ORS Available:	yes		no		yes	yes	yes	yes		yes
Knows Growth charts:	no		no		no	yes	yes	yes		yes
Advocates breast-feeding:	12 months		24		12	24	24	24		24
Correct reply on feeding during illness:	no		yes		yes	yes	yes	yes		yes
Timing of supplementary feeding:	6-8 months		10-12		4-6	4-6	4-6	4-6		4-6

Gomez Classification

Normal greater than 90%

First Degree 76-90%

Second Degree 60-75%

Third Degree less than 60%

Results

The mothers from the experimental villages showed a more significant correct response than the control villages on the following subjects (Tables 4-5):

1. Appropriate timing of introduction of weaning foods
2. Knowledge of feeding during illness: fever and diarrhea
3. Understanding of what oral rehydration salts are
4. How to mix the ORS properly
5. Understanding of what a growth chart is used for
6. Understanding of the concept of declining growth (loss of weight)

Both groups adequately defined the activities of the CHW. Mothers from both groups of villages maintained an adequate duration of breastfeeding (20 months). The average age of the mothers from the control group was 30.9 years while that of the experimental group was 29.4. The control group fed an average of 5.7 people out of the family pot while the experimental group managed to feed 6.4 people. There was no significant difference in educational level of the mothers (12% of the control group vs. 15% of the experimental group). The distribution in nutritional status between both groups also showed no difference:

Table 6

<u>Control</u>			<u>Experimental</u>	
<u>n</u>	<u>%</u>		<u>n</u>	<u>%</u>
33	35	Normal	35	36
41	44	First degree	38	40
18	19	Second degree	20	21
$\frac{2}{94}$	$\frac{2}{100}$	Third degree	$\frac{3}{96}$	$\frac{3}{100}$

The control group had 79% of children 0-5 as normal or first degree, while the experimental group had 76%. In relation to other studies in the Sudan (the Red Sea study) and other Third World countries, these data are relatively encouraging. Three caveats are in order. First, the data were collected in November, the final month of harvesting "dura", the staple cereal of sorghum. Although the rainy season was abrupt, and harvests were not as plentiful as expected, no food shortages had occurred at the time of the study. Secondly, since only the youngest children were weighed, the data tend to skew to the first year of life when nutritional status is higher due to prolonged breastfeeding, and thirdly, the mothers living closest to the health post have an easier access to health services.

Discussion and Conclusions

Growth charts: To allow the CHW to judge the adequacy of the child's growth, in order to determine which children are "at risk", there must be ease and accuracy in plotting consecutive points. The current UNICEF chart has an adequate size to permit the recording of weights. The color of the chart should be standardized with that of the MCH program so that the color of the chart becomes synonymous with

Table 7

CONTROL GROUP

Table 8

Village: Heija El Ful

Village: Taysee Abdel Salaam

Male	Female	Nutritional Status	Male	Female
131.00			108.8	100.0
100.8			108.1	100.0
100.0		NORMAL.	107.4	95.5
90.9			105.3	94.0
			98.6	93.8
89.7	89.7		83.3	89.7
89.3	86.2		83.3	87.9
88.7	80.8	First Degree		85.9
88.5				84.0
82.8				80.6
80.8				
75.8	70.8		70.3	75.8
70.7	60.6		65.9	
		Second degree	62.5	
			62.5	
			60.5	
Ave. = 90.8	77.6		Ave. = 84.7	89.7
Total ave. = 86.9			Total Ave. = 87.1	
Normal	23.5%		Normal	43%
1 deg.	52.9%		1 deg.	30%
2 deg.	23.5%		2 deg.	26%
3 deg.	0%		3 deg.	0%

Table 9		CONTROL GROUP		Table 10	
Village: Shororo				Village: Abu Snoon	
Male	Female	Nutritional Status		Male	Female
103.4	90.9			131.3	119.0
99.0				104.7	106.7
96.6				96.8	106.2
90.9				96.8	101.3
				94.0	96.5
89.6	87.5			89.9	88.7
84.9	81.3			88.7	87.0
80.6	80.8	First Degree		82.8	84.9
	80.6			82.8	
				76.1	
72.4	75.9				72.6
68.5	72.1	Second degree			
61.9	66.7				
	53.1	Third degree			55.6
Ave. = 84.5	76.5			Ave = 94.4	91.9
Total Ave. = 80.9				Total Ave. = 93.2	
Normal	26.3%			Normal	50%
1 deg.	36.8%			1 deg.	40%
2 deg.	31.6%			2 deg.	5%
3 deg.	5.3%			3 deg.	5%

CONTROL GROUP

Village: Abu Safifa

Nutritional Status	Male	Female
NORMAL	95.5	
	95.5	
	93.4	
	92.9	
	89.6	89.2
First Degree	85.9	88.5
	84.9	86.0
	84.3	79.6
	84.3	
	80.2	
Second Degree	72.4	
	Ave. = 87.2	85.9

Total Ave. = 86.8

Normal	27%
1 deg.	66%
2 deg.	7%
3 deg.	0%

EXPERIMENTAL GROUP

Table 12

Village: El Efein

Nutritional Status

Male	Female
111.1	114.6
101.0	
90.9	
90.9	
81.0	88.9
	88.9
	87.0
	86.5
	83.3
	80.8
	78.1
	76.0
70.7	75.2
	65.6
	65.6
	60.8
	60.3

NORMAL

First Degree

Second Degree

Table 13

Village: Bilinga

Male	Female
108.9	108.1
108.0	95.2
106.7	93.8
96.3	
78.0	84.8
	78.7
	78.0
72.7	70.8
70.8	60.4
64.5	

Ave=88.9 83.7

Total Ave.=86.6

Ave=90.9 79.4

Total Ave.= 82.9

Normal	25%
1 deg.	45%
2 deg.	30%
3 deg.	0%

Normal	44%
1 deg.	28%
2 deg.	28%
3 deg.	0%

EXPERIMENTAL GROUP

Table 14

Village: Kega Tamero

Male	Female	Nutritional Status
131.6	113.3	NORMAL
106.3		
100.0		

89.9	83.3
83.0	80.1

First Degree

75.3	75.6
	75.2
	73.2
	63.6

Second degree

55.6	50.5
	44.2

Third Degree

Ave.= 91.7 73.2

Total Ave= 81.3

Normal 25%

1 deg. 25%

2 deg. 31%

3 deg. 19%

Table 15

Village: El Kweik

Male	Female
130.0	111.1
118.2	
111.1	
108.9	
106.3	
97.7	
96.0	

89.9 88.7

87.5 81.0

87.0 80.9

83.3 80.3

82.5

78.2

70.8

69.9

Ave=98.2 83.2

Total Ave.= 93.0

Normal 40%

1 deg. 50%

2 deg. 10%

3 deg. 0%

EXPERIMENTAL GROUP

Table 16

Village: Ankarko

Nutritional Status	Male	Female
	114.9	92.4
	114.0	
	108.1	
	98.9	
Normal	96.6	
	95.7	
	95.2	
	94.4	
	92.9	
	<hr/>	
	88.5	88.5
	85.5	84.8
	76.1	82.8
		82.8
First degree		80.1
		79.7
		79.8
		77.4
	<hr/>	
Second Degree	75.9	
	<hr/>	
	Ave. = 95.1	83.1

Total Ave. = 90.2

Normal	45.5%
1 deg.	50%
2 deg.	4.5%
3 deg.	0%

growth monitoring activities and can be identified irrespective of which agency or institution is carrying it out. There should be a separate card and color to record immunizations, again, to facilitate identification of a separate program.

Plotting of points tended to be exactly at intersections of the squares. Training of the CHW should explain that weights can fall at any point on the graph including the middle of the squares. Some graphs were plotted from right to left, obeying Arabic direction of writing, even though the standard curves on the growth chart were from left to right. The rationale for keeping the growth curves from left to right, is that mathematics and science are taught in the Middle East based on a Western orientation. This consultant is not convinced that the above rationale is more beneficial to the CHWs and the mothers than producing the growth charts in the reverse orientation from right to left.

Weighing Sessions:

Women's time for child-rearing competes with her responsibilities in other household activities and production or marketing outside the home. (Franklin and Vial, 1981). When primary health care programs are designed, the time of women tends to be undervalued or forgotten. A service such as growth monitoring requires time and will compete with other obligations. The CHW must ask the mothers when it is most convenient to hold monthly weighing sessions at the health post. The mothers must be "convinced" and recognize the "usefulness" of weighing sessions in order to allocate spare time for such an activity. This consultant's impression is that the mothers enjoyed the social aspect of congregating with their children and felt a certain amount of prestige in receiving

the attention for growth monitoring. The pilot project has successfully promoted an awareness of child growth among the mothers.

The actual weighing when performed inside the health post did not permit easy reading of the dial, because of poor lighting. If the scale is moved outdoors to a brighter spot, there should be shade nearby, so that mothers and children do not have to wait in the hot sun. The CHWs tend to read the weights to the nearest higher whole number, and this was reflected in the recording on the growth chart.

The CHWs could easily calibrate the Salter Scale to the zero level, and the scale itself proved to be durable, reliable, and easy to transport.

There was little or no follow up of children "at risk". The CHW should make every effort to visit "at risk" children on a weekly basis in the home, and carry the portable Salter Scale for additional weighings.

Oral Rehydration Therapy:

There was widespread knowledge of ORT and oral rehydration salts (ORS) were readily available in the villages. A separate survey on use of ORS was carried out at the Kadugli Hospital in the ward of dehydrated and malnourished children. Although the ORS were available, children were still being treated with intra-venous solutions in an extremely unsanitary environment. The WHO/UNICEF statement on the management of diarrhea in Appendix 2 provides the essential points in training CHWs and VMWs for use of ORS.

The mothers had a difficult time referring to ORS in technical language. A more suitable word such as "glucose" would be easier to say and would not be interpreted to mean only sugar.

Reporting:

"The system is almost by design a strictly one-way street in which the traffic of information flows upwards with only little droplets occasionally trickling down to lower levels." (Rural Health Support Project, AID, 1983)

Reports are received at the Statistics Division in Kadugli from the four regions in South Kordofan: Kadugli, Dilling, Alfula, and Abu Jibaiha. They are tabulated and sent up to Khartoum. The CHW fills out the monthly form on morbidity and mortality on a sporadic basis, seldom during the rainy season. Since there is no reverse flow of information, CHWs do not know how their performance compares with other villages, nor do they know the recent trends in their own villages. Until the process of reporting becomes more consistent and streamlined, insistence on an additional monthly report such as tabulation of growth monitoring activities will only complicate at this time the CHWs' responsibilities. An evaluation in the future should be based on village growth charts and records.

Supervision:

In a March, 1983 Progress Report from the Nutrition Officer of UNICEF, the first recommendation is: "Supervisory visits by Senior Medical Assistants should be conducted at least bi-monthly in order to refresh and reorient CHWs and VMs to the details of the project activities as spelled out in the project document, The visits should coincide with weighing sessions and particular attention should be paid on advising CHWs on recording, reporting, and use of weight charts."

This consultant would underscore the above recommendation with slight modification as the most important recommendation of this evaluation. The modification would be to not expect the SMA's visit to coincide with the weighing

session because of the impracticality of communication between villages and Kadugli. However, the SMA (senior medical assistant, who is also the trainer of the Community Health Workers in the growth monitoring) must have access to a vehicle, a driver, fuel, to be able to visit every village at least once a month, to give advice to the CHW, check the progress of growth monitoring activities, resupply the CHW with growth charts, and medical supplies, and provide continual positive reinforcement for the package of primary health care activities.

LIST OF DOCUMENTS CONSULTED

1. "A Proposed Methodology for Testing Nutritional Surveillance in South Kordofan Province," Richard M. Lockwood, Consultant Report, 1981.
2. Pilot Project of Growth Monitoring and Nutrition Education, Kadugli and Dilling Districts, South Kordofan, Democratic Republic of the Sudan August 1982-March 1983," Nutrition Division, Ministry of Health, Aug.1982.
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LIST OF PERSONS MET

1. UNICEF Khartoum:
 - Samir Basta, Country Director
 - Yoshiteru Uramoto, Nutrition Officer
 - S. Farooq, Program Officer
 - Tony Carter, Program Officer
 - Joe Karuki, Project Support Officer
2. UNICEF Kadugli:
 - Gianni Bacego, Water Development Advisor
 - Dominic Milioni, Administrative Officer
3. UNICEF El Obeid
 - John Zins, Zonal Development Officer
4. AID/Khartoum
 - Dr. Mary Ann Micka, Health Officer
 - Bruce Strassburger, Chief of Party, Rural Health Support Project, Ministry of Health
5. Ms Ihsan Mustafa
 - Nutritionist
 - Nutrition Division
 - Ministry of Health, Khartoum
6. Ms Ihsan Ahmed Hassan
 - Nutritionist
 - Nutrition Division
 - Ministry of Health, Khartoum
7. Dr. Kamal Ahmed Mohammed
 - Director of Nutrition Division
 - Ministry of Health, Khartoum
8. Dr. Baldo
 - Director, Maternal Child Health Services
 - Osduman
9. Dr. Ali Belly
 - Department of Community Medicine
 - Faculty of Medicine
 - Khartoum

10. Dr. El Fatih El Samani
Department of Community Medicine
Faculty of Medicine
Khartoum
11. Dr. Mirghani Suleiman
Director of Health Services
South Kordofan
12. Sadia Kowa Hussein
Nutrition Educator
Kadugli
13. Mohammed Jabir
Senior Medical Assistant and
Tutor for training CHW
Kadugli

APPENDIX 1

TRAINING SCHEDULE OF THE PILOT PROJECT GROWTH AND MONITORING
AND NUTRITION EDUCATION SOUTH KORDOFAN, 21 - 26 AUGUST, 1982

DATE	1st SESSION 7:30 - 8:30	2nd SESSION 8:40 - 9:40	3rd SESSION 10:30 - 11:30	4th SESSION 11:40 - 12:40	5th SESSION 12:50 - 1:50
SAT. 21 Aug.	<u>VISIT HOSPITAL</u> Serious signs of PEM, V.A efficiency, Anaemia		<u>DISCUSSION</u> On serious signs and Dangers of PEM, V.A, ANAE		<u>DISCUSSION</u> Milestones in ACHILD's Development
SUN 22 Aug.	<u>DISCUSSION</u> Warning signs of PEM, V.A, Anaemia	Possible Causes	<u>DISCUSSION</u> Prevention of malnutrition N/Y, S/T Adverse family condition	Diarrhoea and infectious diseases Food contamination	<u>DISCUSSION</u> Food availability
MON 23 Aug.	<u>VISIT HOSPITAL</u> Serious signs of Dehydration	<u>DISCUSSION</u> Prevention of Dehydration	<u>PRACTICAL LESSONS</u> On Oral rehydration Therapy at home		<u>DISCUSSION</u> Distribution of Ors
TUE 24 Aug.	<u>DISCUSSION</u> What is growth monitoring	<u>DISCUSSION</u> Other ways of monitoring Growth	<u>DEMONSTRATION AND PRACTICE</u> How to weight a Child; How to record on a Chart		<u>ROLE PLAY AND DISCUSSION</u> How to assess the record; Nutrition Counselling
WED. 25 Aug.		<u>V I S I T T O A V I L L A G E</u>			
		<u>PRACTICAL LESSONS/</u> Recording, History and Reputation	on the job training of Weighing, taking, Assessment, counselling		
THU. 26 Aug.	Discussion on what need to be done when returned to the village.		Presentation by groups	Summary Model Activities in a village	

PROGRAMME RECOMMENDATIONS

Comprehensive programme approach

Successful prevention and treatment of dehydration from acute diarrhoea requires a comprehensive programme approach at the national level which includes efforts on three fronts:

- (a) improving the outreach and effectiveness of diarrhoea management throughout the health system;
- (b) using all available channels to disseminate knowledge, impart skills, and encourage the practice of better management of diarrhoea; and
- (c) producing and distributing appropriate supplies and equipment for the management of diarrhoea.

Use of health system for delivery of ORT

Efforts need to be directed at three levels: the household, the community, and the clinic or hospital. Early home therapy is important to prevent dehydration, ORS is needed to treat most cases of dehydration, and intravenous therapy is required to treat severely dehydrated cases. Efforts must be directed at strengthening health delivery services and enlisting community participation to support activities at all three levels. More specifically:

- (a) In the home, mothers and other members of the family should be informed and trained (i) to recognize diarrhoea in infants and children as an illness requiring early treatment; (ii) to prepare and give a "home remedy" by mouth; and (iii) to recognize when they should seek additional care,

including ORS. The type of household solution to be used and its method of preparation must inevitably vary from country to country and even within regions in the same country, depending on such factors as cultural practices, the food normally used in the home, the price and availability of salt and sugar, the ability of mothers to prepare a solution accurately, the presence of standard measuring utensils, and the extent of outreach of the health delivery system. Any of the approaches indicated above for the preparation and use of home remedies can be adopted, though in most areas some operational research may be needed to determine which of the approaches is most feasible, safe, and effective. It is recommended that, if possible, the home remedy should have sodium and glucose concentrations that are between 50-100 mmol/l. The presence of even a small amount of potassium (e.g., that provided by fruit juices) can be beneficial. Making ORS packets routinely available for home use is probably feasible and desirable in only a few (usually small) countries; in the majority of countries the goal should be to have ORS packets readily accessible in the community for those who need them and who have had instruction in their use, which means distribution to the most peripheral level of the health services as possible.

- b) The first-level health worker, e.g., a community health worker, has a crucial role to play in disseminating knowledge and skills for the management of diarrhoea, as regards the use of both home remedies and ORS. ORS packets should be available in adequate supply at this level and throughout the entire health system. If this is not possible, maximum efforts should continue towards this end and, in the meantime, as complete a formulation as possible should be used, recognizing its limitations. When potassium is a missing ingredient, patients should be encouraged to drink fluids that are rich in potassium (e.g., juices).

For the preparation of ORS solution the safest water available should be used.

(c) In clinics and hospitals having the appropriate equipment and trained staff, intravenous fluids should be used to rehydrate severely dehydrated cases and the few other diarrhoea patients (e.g., those with vomiting that is not responding to treatment) for whom it is required. Efforts are needed to improve the use and quality of intravenous therapy, especially for young children.

Other aspects of the management of diarrhoea

Two other aspects must complement ORT:

Feeding. Experience shows that food should not be withheld from infants and children with acute diarrhoea. Depending on their feeding status, children should first receive breast-milk or diluted milk feeds; in cases of dehydration, these should be offered as soon as initial rehydration therapy has been completed. Appropriate locally available foods (e.g., cereals) should be offered as soon as the appetite returns. After the diarrhoea ceases, more than the usual amount of food should be given for a short period. The routine use of any special infant formulae (e.g., lactose-free products) for diarrhoea cases should be strongly discouraged as they are only rarely necessary and are costly.

Other drugs. Selected antibiotics should be judiciously used for the treatment of severe dysentery and cholera; otherwise, there is no need for other pharmaceuticals in the routine treatment of acute diarrhoea.

Use of communication channels

Often a contributory cause of childhood dehydration and consequent death is the objection of

the mother to providing fluids to her child suffering from diarrhoea. There is an urgent need to understand her present attitudes, perceptions, and practices regarding diarrhoea as well as those of health and other community workers. Sociocultural research, group interviews and proper pretesting are indispensable tools for the design of messages that will motivate her to a more appropriate and timely response at the first sign of diarrhoea. To change her attitude to the management of diarrhoea, and enhance her capacity for it requires a considerable but sensitive effort in effective person-to-person and mass media communication.

Appropriate educational and training materials need to be prepared to transmit priority messages on the preparation and administration of ORT solutions, the importance of continued feeding, and the need for referral if the child's condition worsens. Lessons on the causes and treatment of diarrhoea should also be given in primary schools.

Mothers require individual instruction and often need to observe a practical demonstration and practise mixing a number of times in order to prepare ORS or "salt and sugar" solutions correctly.

Separate guidelines for the management of acute diarrhoea need to be prepared for first-line, mid-level, and senior-level health workers. These should be based on well-established practices, but adapted to meet local needs.

Appendix 3

Tentative Itinerary for Dr. B. Lockwood/ Consultant, Growth
Monitoring & Nutrition Education, S. Kordofan -----

Date	Time	Activity
31.10.83 (Monday)	16.30	Arriving Khartoum (Meredian Hotel)
1.11.83 (Tues.)	8.30	Meeting Farooq - UNICEF
	9.30	" Tony .. "
	11.00	Dr. Kamal Ahmed, Direct ND/MOH Dr. Ali amid Elsayed, Direct. Rural Health & FIC - MOH.
2.11.83 (Wed.)	8.30	Joe Karuki - UNICEF
	10.00	Dr. Kamal, ND/MOH.
3.11.83 (Thurs)	8.00	Dr. Nicka --- USAID
	10.00	Dr. Baldo --- MOH, Omdurman - Dr. <i>Billy/al Fahh</i> <i>al Sannani</i>
4.11.83 (Friday)	(evening	Yoshi Uramoto --- UNICEF <i>Fact-g Meeting</i>
5.11.83 (Sat.)	9.00	(Meetings with Dr. Kamal, Ihsan
		(Mustafa, Ihsan Hassan, for desi-
6.11.83 (Sun.)	9.00	(going the Evaluation Study.
7.11.83 (Mon.)	9.00	
8.11.83 (Tues.)	6.00	Depart for Elobeid by UNICEF plane (1)
	8.30	Arrive Elobeid
	11.00	Depart for Kadugli
	17.00	Arrive Kadugli

<u>Date</u>	<u>Time</u>	<u>Activity</u>
9-16.11.83		Field work in S. Kordofan. Counterport Dr. Merghani Suliman, Director Health S. Kordofan.
17.11.83	10.00 12.30	Depart Kadugli by UNICEF plane arrive Khartoum
18.11.83		Write up for draft report for submis- sion prior to departure. Final Report to be submitted within 30 days.

- (1) Dr. Lockwood will be accompanied by His Insan Mustafa and Ms Insan Ahmed Hassan, Nutrition Officers, HD/ICM. Khartoum to form a team for the evaluation study.