

International Nutrition Communication Service
(INCS)

CONSULTANT REPORT

for

SIERRA LEONE

(February 22 - March 6, 1981)

(Trip report describing a maternal and child nutrition conference)

BY

Naomi Baumslag - Consultant

Submitted by
Education Development Center
55 Chapel Street, Newton, MA 02160
To United States Agency for International Development
Washington, DC

*This project has been conducted under Contract A.I.D. ANJ 2004, Office of Nutrition,
Development Support Bureau, Agency for International Development, Washington, DC.*

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SEMINAR ON MATERNAL AND CHILD NUTRITION
Freetown, Sierra Leone
22nd February - 6th March, 1981

This Seminar was conducted by the MOHSL (Ministry of Health Sierra Leone) to upgrade nutrition knowledge and skills of physicians and senior level nursing staff as a first step in preparing trainers for primary health care. Inadequate, inaccessible, and insufficient health services for the rural areas are hopefully to be improved by providing basic health services at the village level.

The Ministry of Health realizes the importance of nutrition and the magnitude of the problem. The National Nutrition Survey 1978 revealed that 25 percent of children under 5 years of age are stunted and show evidence of chronic malnutrition. In the survey, it was found that as many as 8 percent of women are less than 5 foot high and 30 percent of malnourished infants have stunted mothers. This is not genetic or racial, but definitely environmental. Furthermore, the survey showed that arm wasting is twice as common in pregnant women. Evidence of wasting (using fat fold thickness) is present in 36 percent of women, especially rural women in the southern province. Anemia is present in 58 percent of the population. The highest rates are in the Southern province where 77 percent have had anemia confirmed by laboratory testing. Macrocytosis is present in 10 percent of the survey population. In addition, high parasitic infestations such as malaria parasites are found in 33 percent of children between 3 months to 5 years old; hookworm occurs in 11 percent of 4-5 year olds.

Maternal mortality is astronomically high: 6.5/1,000 (in developed countries, it is 4.5/100,000). Infant mortality is reported as 160/1,000 but some figures are as high as 200/1,000. There is no question that the

maternal and infant mortality in Sierra Leone is one of the highest in developing countries. The child mortality is 30/1,000 compared to 1/1,000 in developed countries. With this high incidence of anemia, stunting, and maternal wasting, nutrition is considered by the MOH as an important area for preventive intervention in primary care. Furthermore, the national survey revealed that the relative risk of malnutrition in bottle-fed infants is 6 times higher than in breast-fed infants.

Planning Committee

Within the Ministry of Health, there is a standing committee on nutrition planning and education chaired by Dr. Brown and coordinated by Gladys Carrol, Chief Nutritionist, MOHSL.

Members

- G. Carrol - Chief, Nutritionist, Ministry of Health
- Dr. N. Browne - Deputy Chief Medical Officer - Chairman
- Dr. Brew Graves - Director, WHO Fertility Advisory Services and Family Health
- Dr. M. Wright - Specialist Pediatrician
- Mrs. E. Randall - Senior Health Sister
- Mr. A. Abu - Senior Health Education Officer
- Dr. Gba Kamara - Director, MCH Division MOH
- Ms. M. Duffy - Health Officer, REDSO/West Africa, USAID
- Dr. N. Baumslag - Consultant, USAID (temporary)

A meeting was held upon my arrival with the committee to finalize the seminar agenda, finances, and procedures. It should be noted that cable traffic from DSB/N was held for Mellen Duffy and the list of lectures I was to give was received only after my arrival. The committee had allocated some subjects that I prepared to other speakers. This breakdown in communications

resulted in unnecessary concern and work for several persons. It is recommended that in the future incoming cables be screened for content and referred to the relevant persons immediately.

It was agreed that as the materials, slides and books requested from DSB/Nutrition early in January had not arrived, the handouts would have to be increased and should include additional charts and tables. It was also decided that observers as well as participants should be supplied with handouts. Furthermore, a pre- and post-nutritional assessment test would be carried out with participants using pseudonyms to allow objective comparisons to be made. It was also arranged for me to visit various facilities and programs so that I would be more familiar with the local problems and solutions.

Handouts

A set of handouts was prepared and consisted of the following articles:

- *1. Mothers and Children Bulletin on Infant Feeding and Maternal Nutrition, Vol No. 1, September 1980.
- *2. Effects of Maternal Nutrition on Infant Health: Implications for Action. An International Workshop, Panajachel, Guatemala, 1979.
- *3. The Obstetrician's Opportunity: Translating "Breast is Best" from Theory to Practice. B. Winikoff and E.C. Baer. Am.J.Obstet. Gynecol. 138:105, 1980.
- *4. Feeding the Weaning Age Group. Guidelines for the Caribbean. Caribbean Food and Nutrition Institute, P.O. Box 140, Kingston 7, Jamaica, 1979.
5. WHO Breast Feeding Recommendations, Nov. 1980.

*30 copies of each had been supplied by the Maternal Nutrition and Infant Feeding Clearinghouse. Additional copies had to be made as observers were also to be given these as handouts.

6. WHO Guidelines for the Trainers of Community Health Workers
on the Treatment and Prevention of Acute Diarrhoea, WHO/CDD/Ser/80.1.

II. Pre-Test and Post-Test

III. An interview was scheduled with Sierra Leone television giving me the opportunity to stress the importance of the forthcoming seminars and the Ministry of Health's concern with nutrition in Sierra Leone.

National School of Nursing

This training centre is headed by Matron Mends who has received additional nursing experience and training in Britain at the Royal College of Nursing. Nutrition has a total of 46 hours in the 3 year nurse training program, and Gladys Carrol directs the courses. (In Botswana, 64 hours of curriculum time are provided for nutrition over 3 years and even there it is not enough time to cover the subject adequately and provide meaningful supervised practicals.)

Maternal Health and Services

Discussions were held with Dr. Belmont Williams, Chief Medical Officer, Ministry of Health. Dr. Williams is a Sierra Leonean with a specialist degree in obstetrics which she received in Britain. She has been training Traditional Birth Attendants (TBAs) since 1974 and incorporating them into the health delivery system. At present, she is in the process of evaluating the program for WHO. More than 80 percent of deliveries in Sierra Leone occur in the home.

Whilst lack of facilities for assisted deliveries is a major problem, female circumcision is also a serious health hazard. These are usually performed by the TBAs through the secret Bundist Society that exercises a

sinister control over the population.

Vesico-vaginal fistulae and mortality are not infrequent sequelae of this procedure. Data is not available for many parts of the country. Most of the data for maternal mortality comes from the Western province, especially Freetown where conditions are better than elsewhere. Maternal mortality estimates are as high (6.5/1,000 compared to 4.5/100,000 in developed countries). Of the known deaths, more than 8 percent are due to severe anemia (Hemoglobin of 8.5 gms/100 ml or less). In 1977 in the Princess Christian Maternity Hospital Antenatal Clinic, Freetown, 33 percent of women were severely anemic.¹ Not only does disease contribute to this state (worms and malaria), but dietary taboos during pregnancy and lactation restrict the adequate intake of food sources.

Dr. Williams said that not much is known about lactation practices and performance of mothers. She was particularly interested in a group of women who even when they are not breast feeding their infants continue to lactate between pregnancies.

Mothers have their own ideas of breast feeding but are easily influenced by traditional medical practitioners.

Currently the leading cause of infant deaths is tetanus neonatorum, a preventable disease in most countries.

AID Mission Sierra Leone

Met with Mr. Alex Dickie, Mission Director; Agriculture Project Officer, Norm Sheldon; and Mellen Duffy, REDSO West Africa Health Officer. I was asked to look at the Regional Conference of Health Economists, and I sat in on

¹ Belmont Williams: Maternal Mortality in Sierra Leone 1977. Ministry of Health Report.

their module on Adolescent Health. I was able to point out that they had left nutrition out of their modules. This group is highly motivated and is involved in Family Planning. I was also asked to review the nutrition education component in the Acre project (Norm Sheldon, project officer). (See Appendix C)

Ante Natal Clinic Princess Christian Maternity Home - Freetown

This clinic is extremely well-organized and had about 200 patients on the day of the visit. This is the model and evidently is not typical. Nutrition education, special programs for adolescents (including home visits), and a special program for anemic women, as well as routine ante-natal care and health education, is provided by well-trained and knowledgeable staff. One of the pregnant women gave the nutrition education talk on foods for pregnancy using a flannel board with food pictures. The mothers enjoyed this talk.

The clinic has a working arrangement with TBAs to bring their patients in for their first antenatal checkup and for hemoglobin and blood group examination. There appears to be a good relationship between the trained staff and TBAs. Since 1974 these community workers have been identified and given 3 weeks training in basic midwifery at the district level. This has been possible through the Ministry of Health.

Maternal Child Health Aides (MCHA)

Young women with primary school education are trained in basic midwifery and child care so they can function more effectively at the village level.

I met with several MCHAs at the clinic. They are well-informed and have had practical experience. They stated that their main problem is lack

transportation and shortage of essential drugs such as ergometrine, anti-tetanus toxoid (for pregnant women), and lack of even iron and folate tablets. Ergometrine tablets when provided are unstable and deteriorate. In the clinic, PPD testing for tuberculosis often is not available. Since tuberculosis is a major health problem, many early cases are missed.

The MCHAs are also concerned that mothers are using bottles early with insufficient milk powder or other products in the bottle. They said that it is not uncommon to be told by mothers that their milk is "bad." The MCHAs supervise the TBAs and, in turn, they are supervised by the State Enrolled Community Health Nurse (SECHN).

State Enrolled Community Health Nurses

These nurses receive one year of general nursing, nine months of midwifery, and nine months public health training so that they can function at the health centre level responsible for antenatal, maternity, post natal care, and under fives clinics. They supervise the MCHAs.

Connaught Hospital Under Fives Clinic

The clinic provides well child and sick child care. The children are weighed before they are examined. SECHNs examine children and prescribe for common illnesses and manage cases of malnutrition. Staff here, too, are concerned with the shortage of essential drugs and lack of transportation limiting home visits for follow-up.

The clinic provides cooking demonstrations, and patients are given portions for tasting. Efforts are being made to demonstrate multimixes using staples, e.g. rice and beans. Dried fish powder is also used. People are asked to avoid spicing children's food, e.g., the use of peppers and chili.

In this clinic, there is a Food Aid Program provided by Catholic Relief Services (CRS). The requirement of beneficiaries is a fee (allegedly to cover transportation costs). Also, fees are paid for special Capone growth charts. At present the clinics are short of National growth charts and so, unfortunately, two systems are in operation. Concern was expressed by the staff regarding the fact that poor people who cannot pay the fee cannot get food supplements either. Until recently corn, soy flour, soy oil, and skimmed milk were handed out but, as the U.S. is experiencing a corn shortage, this will be replaced by additional powdered milk. This was not welcome news. Evidently here, too, when there was no food aid, clinic attendance fell. Several members of the clinic staff expressed their concern that CRS may pocket the money that is collected by the nurses who do all the work. In return for distributing the food and collecting the money, the clinic staff would like to have free food for needy patients, as well as some additional drugs or vaccines. CRS, needless to say, sees the situation differently.

Visit to Connaught Hospital Pediatric Section

Met with Drs. M. Wright and Tubuko Metzker. Dr. Metzker has seen several cases of idiopathic cardiomegaly in infants and wonders if thiamin deficiency could be a factor in the etiology, as "China rice" is now being widely used and parboiled rice is scarce. Discussions were held with Dr. Thomas, a food scientist, and he and Dr. Metzker will work on this problem. I promised to send relevant references.

Dr. Wright (a pediatrician) expressed his frustration with mothers who insist they do not have enough milk or that their milk is "bad." At the time of my visit, the beds had evidently been cleared for intake and few

mothers and infants were present in the ward. There also appears to be another reason for the scarcity of patients; namely, that services are very limited and the shortage of drugs and materials means the patients have to pay for any item used, e.g. sutures. For the poor, this is impossible. At the time there were 2 infants in the ward with their mothers using Lactogen in insufficient quantities - one tin (500 gms) lasted 1 month (one scoop for 8 oz. of water). The nursing staff was not aware of how the milk was being used! Nor had the nutritionist done anything about it. The nutritionist, however, had a display of fresh fruit and food for nutrition education.

Lumley Clinic and Cassava Farm

The director of the program is Dr. Brew Graves, a World Health Consultant. He has expanded Sierra Leone's first family planning program (started in February 1980) into a primary health care program. The project serves 270,000 persons. The poor urban areas served in this program are where Dr. Brew Graves feels the problems are.

Health care is provided primarily by Community Health Nurses. Home visiting is an essential part of the program. The health workers are polyvalent and provide mobile teams to deal with environmental health, family planning and spacing, as well as nutrition. To maximize the nutrition effort, the Kayunga nutrition-type scouts² concept is being tried here (Uganda Model). These scouts chosen by the community are trained for 6 weeks to recognize and treat malnutrition. Travelling by bicycle, they home visit and do a nutritional assessment using arm circumference. They advise mothers on nutrition, general child care, and domestic sanitation.

²The Kayunga Nutrition Scouts Project. J. McDowell, IUNS Working Conference, National Institute of Nutrition, Hyderabad, India, 1977.

In order to motivate workers and encourage home visits, financial incentives are provided to the staff as government salaries are so low. Taxi fare (ten leones per day) is provided in addition. This is cheaper than keeping vehicles. This program has a large training component. Workers are also retrained or additional components added to their training as these become more relevant.

Measles and tetanus are major health problems. Sickling is also a serious health problem in the area and is probably as prevalent as in Ghana--- namely, 20 percent of the population.

Cassava Farm Community

Two community health nurses and I were transported via ambulance to a tin shanty slum serviced by the project, and I met with the traditional birth attendant. She assembled mothers and infants for our visit. Several of the mothers had gone to "town" and left their infants to be bottle-fed by neighbors. Lactogen is in most bottles. The TBA was supposed to be knowledgeable about mothers in her area. She accused one mother of not going to clinic for antenatal. The woman was outraged and produced her card to show that she had been to antenatal clinic recently. A visit to the TBA's rented room where she lived and which she used as "a maternity" was totally inadequate from a hygienic point of view. She had an unused kit which had been provided by the Ministry of Health. Her records left a lot to be desired. She obviously had no assistance from the Community Health Nurses, let alone supervision. They had never even inspected her premises, nor had they done anything about the hygienic conditions in the area.

The government aims to integrate and redirect the entire health delivery system towards a community health or primary care concept through:

1. Department of Community Health - Dr. Williams is the Chairman of Community Health, and is primary health care oriented. The specific purpose of the department is to organize and support research and education in the field of community health to improve planning and evaluation of health care services in Sierra Leone.
2. A paramedical school at Bo is currently under construction, but due to the corruption and inefficiency in the government, is progressing very slowly. The new principal is Dr. I. W. Aitken, and he is now recruiting staff. In addition, the British Medical Research Council is hoping to set up a research centre. At the time of my visit, Dr. Wharton and other members of the British team were in Sierra Leone for discussions with the Ministry of Health and the university. The third part of the program training program is the establishment of an Institute of Health Science which as yet has not been created. It is to operate as a "coordinating body for planning, operation, and integration of health and medical education, training, and service in Sierra Leone."

Catholic Relief Services (CRS)

Discussion with staff of CRS in Freetown revealed their concern that the program run smoothly. Nursing staff had expressed their concern about the program. I wondered if the same problems that existed in Lesotho were also surfacing here.

As mentioned previously (p.8), there is a shortage of weight charts issued by the Ministry of Health. Patients can now buy a Capone's growth chart and

two systems are operating. This is very confusing for clinic staff, let alone for mothers. Another problem I see with the chart is that an infant may not be gaining weight but, for example, may remain in the 80th percentile. The rate of growth is important in the early ages, not the position of the weight on the percentile chart. Several suggestions were made to CRS Sierra Leone for improving their program:

- 1) That they meet jointly with the Ministry people, as well as clinic staff doing the recording and charting, so that there can be some agreement on which system to use.
- 2) Better selection of recipients must be made. Currently the very poor and those most in need are excluded as they cannot pay the monthly fee.
- 3) Supplies are irregular and this affects clinic attendance.
- 4) There should be labels on the commodities stating the date of expiration, especially for milk powder.
- 5) Alternate local food sources should be explored and substituted in the program. It was suggested that a dried fruit industry be explored since there is an abundance of fruit in Sierra Leone and a lot of it goes to waste. At peak periods, it could be bought up, sun-dried, and distributed. Fruits such as mangoes and guavas could be used as good sources of calories.
- 9) A weight chart for mothers in pregnancy is much needed and would be most useful. CRS should consider developing such an instrument instead of supplanting the MOH growth charts with their own.
- 10) CRS should realize it is only a donor and its activities should be coordinated within the Ministry of Health, possibly through the Nutrition Planning Committee.
- 11) Other sources of food that are not imported should be utilized and explored.
- 12) Nutrition education programs are sadly wanting in feeding programs and more effort needs to be put into this.

SEMINAR ON MATERNAL AND CHILD NUTRITION

2nd - 6th March 1981

The Seminar was held for physicians and senior level nursing staff - a total of 25 participants. There were also 30 observers from voluntary agencies, the private sector, and mission hospitals. In addition, senior nursing students attended several of the sessions. The opening was attended by the U.S. Ambassador, the AID Mission Director, the Minister of Health, and Chief Medical Officer of the Ministry of Health. There were about 100 people at the opening. The whole procedure including the keynote address was televised at prime time on Wednesday night at 9:00 p.m.

The keynote address was on MCH priorities and actions (Seminar program and lectures in Appendix). Whilst 5 lectures were prepared, not all were presented.

A pretest was held and was repeated at the close of the Seminar on Friday, the 6th (results to be tabulated and sent to DSB/N when ready).

Sessions were very stimulating and much discussion ensued. Concern was expressed about the mental effects of nutritional deprivation, especially as one quarter of under fives in Sierra Leone were stunted. In the breast feeding session, Ms. Randall stated several mothers believed their milk was "bad" and that traditional practitioners encouraged them to stop breast feeding by telling them that their milk was bewitched. She stated that some mothers even believed that there were worms in their milk. Traditional healers added lemon juice to milk and showed it curdled and mothers were then told the milk was bad. The yellow color of colostrum is also regarded by many women as pus and hence discarded. Another common practice in Sierra Leone is to give the baby water right from birth upwards. Usually the water is boiled.

There are many dietary beliefs as to what foods affect breast milk and the infant's health. Many of these beliefs are listed in Sylvetta Scott's publication.³

It also emerged that people didn't realize that sucking is the stimulus to milk production.

During discussion on weaning foods, self-sufficiency was discussed. The question was raised why Bennimix, an excellent weaning food (made from sesame seeds, benniseed, rice, and ground nuts), was not readily available. Dr. Thomas, the director of the program, was quick to point out the transportation and lack of electricity aggravated production and distribution and obviously affected supply.

The session of diarrhoea was highlighted by Dr. Hilery who is a missionary and director of Sebaru hospital and has started providing primary care in her region. She had some of her staff put on a play about diarrhoea. The story briefly was of a young woman whose child developed diarrhoea and wasn't recovering (a doll was used for the child), and the husband called the herbalist. The woman was blamed by the herbalist as being unfaithful. A heavy fee was charged. The mother denied that she was unfaithful and cried that the child was still sick. A village health worker arrived and told the mother to boil water and add salt and sugar and how to feed the child. The child got better. The acting was excellent and this stimulated much discussion. It was suggested that coconut water could also be used as in Gambia; that in cases where vomiting was severe and persisted, even though it was impossible, patients should be told to get to the hospital so that they didn't blame the therapy and totally abandon it. Transportation in many areas is a very severe problem. To traverse the swamps can take 6 hours to

³Scott, S., Food Beliefs Affecting the Nutritional Status of People in Sierra Leone. Care Sierra Leone 1978.

travel half-a-mile. It was pointed out that breast feeding should especially be continued in this period.

The papers, discussion, questions, and recommendations are to be published as an outcome of the meeting. (For lectures prepared and presented, see Appendix B).

Nutrition Workshop for Trainers of Community Health Workers (November 1981)

During the first 2 days of the meeting, Dr. Burke, an INCS consultant, was busy with the Regional Nutrition Education Meeting due to take place in May. This took valuable time away from our planning for the November grass roots trainers session, an overlap that was the consequence of poor scheduling. We were, however, able to discuss the format for the November workshop. Materials for the workshop were decided on and will be ordered soon. Teaching slides and paper, too, will be ordered. The November Group leaders are to be selected, and they will in turn select five trainees each. The selected participants list will be reviewed by the Nutrition Planning Committee.

Every effort will be made to make the meeting practical and provide maximum participation. The schedule is to be finalized by mail. Furthermore, it was decided that Mellen Duffy, Gladys Carrol, and Naomi Baumslag would submit a paper on the meeting for the APHA's newsletter on the workshop on maternal nutrition and infant feeding.

In conclusion, the meeting was stimulating; much exchange of ideas occurred. It was also planned that this seminar momentum and interest will be kept up by activities each month to keep the selected trainees aware of new activities and having special sessions to allow them to brush up on skills.

*Note: Materials pouched from Sierra Leone have been lost in transit from the Office of Nutrition to Bethesda, Maryland, and several of the contacts and documents are missing.

APPENDICES

TENTATIVE PROGRAMME*

MATERNAL AND INFANT NUTRITION SEMINAR

To be held at the National School of Nursing
Freetown.

Monday 2nd March

- 9-945 Registration.
- 10.00-12.00a.m. Opening Ceremony
- 12.00-2.00p.m. Lunch Break
- 2.00-3.00p.m. Chairperson - Mrs. Gladys Carrol
Factors affecting foetal, Infant and Child
Development - Drs. M. Wright
- 3.00-4.00p.m. Slides and films.

Tuesday 3rd March

- Chairperson - Dr. M. Wright
- 9.00-10.00a.m. Nutritional Requirements of the Pregnant
and Lactating Woman - Dr. Bailah Leigh
- 10.00-11.00a.m. Nutritional Requirements of Children -
Dr. Tuboku Metzger.
- 11.00-11.30a.m. Tea Break
- 11.30-12.30p.m. Breastfeeding - Dr. Baumslag
Chairperson - Dr. Gba Kamara
- 2.00-2.45p.m. Traditional Influences on Breastfeeding -
Mrs. E. Randall.
- 2.45-3.00p.m. Break
- 3.00-4.00p.m. Weaning - Dr. N. Baumslag
Discussion.

Wednesday 4th March

- Chairperson - Mrs. P. Greene
- 9.00-10.00a.m. Weaning - Dr. H. Thomas
- 10.00-11.00a.m. Anthropometric and Dietary Assessment of
of Nutritional Status - Mrs. G. Carrol
- 11.00-11.30a.m. Break
- 11.30-12.30p.m. Clinical and Biochemical Assessment of
Nutritional Status - Mrs. D. Faulkner

Wednesday 4th March

Chairperson - Dr. G. Gage

2.00-2.45p.m. Diagnosis, treatment and prevention of Protein Energy Malnutrition - Dr. O. Robbin-Coker

2.45-3.00p.m. Break

3.00-4.00p.m. Diagnosis, treatment and prevention of anaemia - Dr. V. Willoughby.

Thursday 5th March

Chairperson - Dr. A. Tuboku Metzger.

9.00-10.00a.m. Diarrhoea in Childhood - Dr. Gba Kamara

10.00-11.00a.m. The use of oral rehydration therapy in the treatment of diarrhoea - Mrs. S. Kawa

11.00-11.30a.m. Coffee Break

11.30-12.30p.m. Methods of Nutrition Education - Mr. A. Abu

2.00-2.45p.m. Chairperson - Mrs. O.M. Mends

The Role of the Sister in Nutrition Education - Mrs. E. DeGrange

2.45-3.00p.m. Break

3.00-4.00p.m. Nutrition and Infection - Dr. Brew Graves

Friday 6th March

Chairperson - Dr. O. Robbin-Coker

9.00-11.00a.m. Social and Psychological Factors Affecting Nutritional Status.

Dr. Ola During

Mrs. V. Gilpin

Miss V. Pratt

Mrs. F. Dahniya

11.00-11.30a.m. Break

11.30-12.30p.m. Evaluation - Mrs. G. Carrol and Mr. A. Abu

3.00p.m. Closing Ceremony

LECTURES PREPARED FOR SEMINAR ON MCN

Freetown, Sierra Leone - March 2nd-March 6th, 1981

1. MCH Priorities and Program Implications
2. Breastfeeding Update and Public Health Implications
3. Recommended Dietary Allowances
4. Nutritional Assessment
5. Supplementary Feeding and Weaning
6. Nutritional Anemias

REVIEW OF PROPOSED NUTRITION COMPONENT IN ACRE PROJECT

The agricultural project in Sierra Leone will be the first agricultural project in West Africa to have a clinical nutrition component. This integration of nutrition and agriculture has widespread health implications and could effectively improve the nutrition status of families in target areas.

A few problems dealing with the size of pilot families and their selection are found in the proposal's preliminary activities for the ACRE Nutrition Component. The details will have to be carefully defined as early as possible if the data is to be representative of the areas and the results generalized. The content of the questionnaire and the observations chosen will have to be scientifically selected if meaningful data is to be obtained. If possible, anemia should be investigated, as well as measuring weights and heights. It might be possible to explore the significance of the widespread carotenemia, and in patients with high carotene levels, the levels of Vitamin A.

Another area that might be useful to explore is the possibility of drying fruits as a method of storage and making the dried fruit available to children as a source of calories. Lists of seasonal foods and their market costs could also be developed.

Breast feeding practices, formula use and bottle feeding could be ascertained if the pilot families are correctly selected. With careful planning, the nutrition component could be a vital part of the project. The study of the pilot families could be invaluable in determining existing family practices and means of improving those that are worthwhile.

Proposal For Nutrition Component
of ACRE Project

- ACRE Project Nutrition Subgoal : To improve nutrition status of families in target areas, especially children and mothers.
- Nutrition Survey: The use of the very recent National Nutrition Survey Report conducted in 1978 will be used as a base line guide for nutrition status. Small scale base-line survey will, however, be conducted to collect necessary information, that is lacking in the National Nutrition Survey Report.
- General Objectives:
- 1) To develop the Nutrition Component of A Food Crop Adaptive Research and Extension System responsive to the needs of rural small holders.
 - 2) To strengthen the capacity of the Nutrition Unit of N.U.C. to carry out detailed nutritional studies of varieties of food crops grown in ACRE project, including nutritional analysis and consumer acceptability studies.
 - 3) To encourage growth, preservation, and optimum utilization of a variety of nutritious foods.
- Activities (specific objectives):
- 1) To investigate nutritional values of local as well as introduced foods.
 - 2) To collect data on local methods of preservation and utilization of food crops, including technologies.

- 3) TO study current practices and use of crops by different ethnic groups in ACRE target areas, especially in relation to diets during weaning period.
- 4) To collect information on food beliefs related to particular ACRE crops.
- 5) To conduct research in preparation of ACRE Food Crops for improved nutrition, especially for weaning foods.
- 6) To prepare recipes and methods for processing ACRE crops and test locally available and more sophisticated equipment.
- 7) To develop and test new recipes for preparation of ACRE crops and carry out acceptability tests among consumers.
- 8) To conduct workshop/seminar for field workers and group leaders of farm families on nutrition activities of ACRE.
- 9) To advise research division on crop combinations, crop acceptability and nutrient composition of different varieties. (Advice to be focussed on protein content and biological value but other nutrients and total energy value to be considered as well).
- 10) To develop teaching aids and visual aids for nutrition education and implement a nutrition education

program in ACRE zones emphasizing special food needs of various family members.

11) To demonstrate special techniques of food preparation preservation and storage to ensure a year round supply of ACRE food crops.

12) To develop low cost methods of food preservation,

13) To provide in service training for extension nutrition workers of ACRE.

Preliminary Activities for ACRE

Nutrition Component

1. Baseline survey
 - a. Target: 60 "pilot" families in each of 5 ACRE areas.
 - b. Interviewers: Home Economics Students (others if necessary)
 - c. Supervisors: Mrs. Dahniya and staff
 - d. Information needed:
 - 1) specific foods currently consumed by families in ACRE areas
 - 2) specific foods used for diet of weaning children
 - 3) methods of preparation of particular foods (legumes, cereals and vegetables) and recipes
 - 4) methods of preservation/storage of particular foods
 - 5) technologies currently used for food processing, preparation, preservation
 - 6) Food beliefs related to ACRE crops
 - e. Time Frame: March-April 1981
 - f. Methods:
 - questionnaires
 - observations

2. Hold meeting to discuss nutrition component of ACRE
 - a. role of nutrition unit in research activities
 - b. role of nutrition unit in extension activities
 - c. joint ACRE seminar on nutrition considerations in ACRE project with key project staff.

3. Ordering/purchasing nutrition books, films, slide sets, etc. for nutrition unit
 - a. prepare list and quantities and prices
 - b. order and receive
 - c. organize nutrition resource center for nutrition unit and other ACRE departments

4. Nutrient analysis capability developed
 - a. Information gathered on equipment/reagent needs and methods
 - b. Laboratory equipped to analyze:
 - caloric value
 - total protein
 - certain amino acids
 - iron content (?)
 - Vit. A content (?)
 - calcium content (?)
 - c. Analysis of:
 - 1) nutrient values of varieties of ACRE crops
 - 2) effect on nutrient composition of ACRE crops and combination of foods of various methods of food food preservation/processing/preparation.
 - d. Responsibility for laboratory - ACRE Research Unit/
Nutrition Unit/Chemistry Laboratory
 - e. Trained personnel (perhaps through United Nations University)

5. Purchase necessary local and imported equipment for recipe testing
 - a. Local cooking/preparation/processing equipment
 - b. Imported equipment for processing/preparation/cooking.

SUMMARY

SIERRA LEONE NATIONAL NUTRITION SURVEY DATA 1978

MCH Workshop

Freetown, Sierra Leone

March 198

SIERRA LEONE SURVEY DATA 1978

1. The prevalence of Luashiorhor in the community is low as indicated by edema a very late sign present in only 0-2 percent of the survey population.
2. There were a lot of short mothers. 8.2 percent had a height of less than 150 cms (4'11"). A high percent of children of low stature mothers 30 percent compared to 19 percent of well nourished mothers were malnourished. Eight four percent of children chronically malnourished do not have short mothers. Furthermore, Freetown tribesmen have less chronic malnutrition than tribesmen outside Freetown 1.2 percent compared to 27.3 percent. This information all lends support to the evidence that environmental factors including diet and poor health are more important than genetics in determining a child's stature.

Arm wasting (arm circumference of under 23 cms) indicates undernutrition. This is present in six percent of women and was twice as prevalent in pregnant women.

Fat fold thickness of less than 7.5 mms indicates fat wasting and indicative of a low caloric reserve was present in 36 percent of women most prevalent in the Southern

province. Inadequate diet and activity affect this measure.

An arm circumference of over 29 cms was present in 23 percent of Freetown mothers and only 12 percent of rural mothers. This could indicate a higher caloric reserve.

Obesity does not seem to be a problem less than two to three percent of women have a striceps fat fold over 25 mms.

Acute Undernutrition

Defined as weight/height less than 80 percent of expected for a reference child of the same height. Reflects recent events. This was three percent in all areas and peaked at 12-14 months age group. This has program implications. Of significance is the fact that only 0.6 percent of the special group are undernourished. This is a relative risk of five. The survey was carried out at a time when food availability was at its best.

UNDERWEIGHT

This is indicative of PEM of unspecified duration. This was determined using less than 80 percent of expectant weight for a reference child of the same age. Throughout the country 31 percent were underweight and the lowest prevalence was in children under three to five months of age.. This pattern was altered in the second six months and rose

to peak in the second year. The highest rates were in the rural areas, 32 percent compared to 18 percent in Freetown.

Of interest was the fact that the survey revealed that bottle fed infants had a six fold higher rate of under-nutrition than breast fed infants.

CHRONIC MALNUTRITION

Weight as manifested by height for age.

Anemia

Using the WHO standards of under 10 gms percent for the 6-23 month old children and under 11 gms percent for 24-59 month old children. Fifty-eight percent were found to be anemics. Most of the anemia was hypochromic microcytic. Highest rates were again in the Southern province where 77 percent had anemia in laboratory testing compared to 50 percent of Sierra Leone children.

Macrocytosis was less common but did occur in 10 percent of survey population. More than 1/4 of the cases were moderate and one percent were severely anemic. The low hemoglobin and hypochromia were closely associated with poor nutritional status.

Malaria

As expected malaria is a big problem, parasites (thick smears) were found in infants; a third of three to

59 month old infants and children and peaked in the one to four year olds. The low rate was in Freetown and 36 percent of rural mothers and infants.

INTESTINAL PARASITES

This parasite was present in 11 percent of children 48-59 months and is also an important cause of anemia.

Discussions Held With:

Gladys Carrol	Nutritionist, MOHSL
Dr. M. Wright	Pediatrician
Dr. Tuboku Metzger	Physician, Connaught Hospital
Dr. Gba Kamara	MCH Director, MOHSL
Mrs. E. Randall	Chief Sister
Sister Dr. Hilary	Serabu Hospital Village Health Project
Dr. Belmont Williams	Chief Medical Officer
Mrs. P. Greene	Director, Home Economics, Farouff College Regional Representative, American Home Economics Association
Dr. H. Thomas	FAO Food Technologist Ministry of Social Services
Dr. Robbin-Coker	Pediatrician - President of Sierra Leone Medical Society
Dr. V. Willoughby	Hematologist
Mrs. O. M. Mendis	Matron-Director of National Nursing School, Sierra Leone
Dr. Brew Graves	WHO Consultant - Director, Fertility Advisory Project, Lumley Clinic
Mr. A. Abu	Acting Director, Health Education, MOH
Dr. Brown	Deputy Chief Medical Officer
Dr. M. Davies	Director, WHO Sierra Leone
dr. I. Aitken	Principal Paraprofessional School at Bo
Dr. Gba Kamara	Director of MCH, Ministry of Health, Sierra Leone
Dr. Williams	Director of Community Medicine
Mrs. Florence Dahwiya	Nutritionist, Bo - Director, ACRE Project Nutrition Component
Dr. Richard Burke	INCS Consultant - Department of Telecommunications, Indiana State University
Mr. Alex Dickie	USAID Mission Director
Norm Sheldon	USAID Project Officer

Site Visits

Nationa. School of Nurses
Connaught Hospital
Princess Christian Antenatal Clinic
Lumley Health Centre
Cassava Farm Community
Freetown Market
Catholic Relief Services

SUMMARY: SIERRA LEONE

1. Population: 3 million in 1980 and about half-a-million reside in capital City, Freetown; 40% are under 15 years.
2. Religion: 70% animist; 25% Muslim; 5% Christian.
3. 80% live in rural areas; 70% of deliveries are carried out without any trained supervision.
4. Divided into the Western area and 3 provinces - Eastern, Southern, and Northern - each with Administrative Headquarters and divided into 12 Districts and 147 Chiefdoms, 36 of which have no health facility.
5. Presently there is no unified law of registration of vital events.
6. There are a number of ethnic groups in Sierra Leone. Mainly there are the Temnes (30%) found in the North, Central and Northwest; the Mendes (30%) in the Southeast and Southwest; Korando in the Northeast and North Central; and Creoles found mainly in the Western area. There are also other smaller ethnic groups such as Mandingo, Susu, Kissi, Vai, Kru, Kono and Yalunka in various parts of the country.
7. Maternal Mortality 6.5/1,000.
8. Infant Mortality 160/1,000 (as high as 340/1,000 in some areas).
Child Mortality 30/1,000.
9. Life expectancy is 44 years, as low as 34.4 years in the South.
10. Literacy rate 10%.
11. Per capita income \$176.
12. Land 30% arable (7.6% cultivated).
13. Major Illnesses: Tuberculosis; Tetanus; Malaria; Hepatitis; Malnutrition; Measles; Leprosy.
14. Leading Causes of Death: Tetanus major cause of neonatal mortality; Measles, 21%; Diarrhoeal Disease, 13.6%; Nutritional Deficiency, 9.4%; Malaria, 4.3%; Anemia, 9.2%.
15. Parasitemia: Malaria - endemic except in Freetown. One-third of children 3-59 months. Urban rate 21% and rural rate 36%. Hookworm - 7% in rural areas; Ascaris - 25% in Freetown.
16. Nutritional Disease
 - (a) One-fourth of children 0-5 years of age are chronically malnourished.
 - (b) Anemia present in 58% of children; 30% of pregnant women (severe anemia).

Summary: Sierra Leone (Continued)

17. Sewage and Water: Only 10% of entire population has access to a public water system. Sanitary sewage disposal is confined to a limited area of Freetown. 15% of Freetown population is served by septic tanks and 34% by pit latrines. Outside Freetown there are no urban sewage disposal systems; even in remote villages, pit latrines are used. The quality and quantity are unknown.

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