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**Design of nutritional monitoring system and
communication strategies for collaborative
maternal nutrition education project in the
Gambia**

by

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INTRODUCTION

In 1985, INCS began a collaborative maternal nutrition education project with Save the Children Federation and the Medical Health Department in The Gambia. The purpose of the project was: to improve maternal nutrition during pregnancy among low-income Gambian mothers (thus improving overall pregnancy outcomes); reduce the incidence of low birth weight babies; and produce a change in attitudes regarding the importance of dietary supplementation to pregnancy outcome. This was to be accomplished through development and promotion of inexpensive, locally based food supplements for pregnant women; the familiarization of TBAs and VHWs in growth and weight monitoring techniques; the implementation of a supportive communications strategy to promote behavioral change in nutrition-related practices, and introduction of appropriate technologies intended to reduce the amount of time and labor spent by women in their work. The pilot project is being carried out in the SCF's High Impact Program, a ten-village area in the Upper Baldi Administrative District.

This report presents the results of the first technical assistance mission carried out by INCS. Dr. Kusum Shah has recommended a monitoring system to measure birth weight outcomes and nutritional status during pregnancy through the use of a network of rural health agents and literate volunteers, who will be trained to utilize pictorial records, scales, and color-coded nutritional assessment tools. A simple system for reporting data and recording information should also be set up and followed. Within the context of this weight and growth monitoring, other nutrition education messages could be disseminated. Among the recommendations made by the consultant were: that further data should be collected that would provide insights into the high mortality rates of infants and mothers; that members of local women's groups, school children, and other villagers be trained so they could support the educational and record-keeping activities of VHWs; and that appropriate color-coded scales, arm-strips, and other tools be developed and tested before being used in the field. Plans are now underway to utilize this consultant's findings in designing an effective nutrition education strategy and formulating a relevant training program for VHWs and TBAs.

Christine Hollis
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December 1985

EXECUTIVE SUMMARY

The objective of the consultant's visit to The Gambia during the period covering 24 September to 11 October 1985 was twofold:

- a) to develop a monitoring system to measure birth weight outcomes and nutritional status during pregnancy;
- b) to design communication mechanisms and techniques to reach mothers and expecting mothers with low level of literacy.

Reliable health and related statistics of the entire country are not available. However, reports of data gathered from a few sources indicate that the rates of maternal, infant and preschool childhood mortality are extremely high. Among the most common causes of deaths during infancy and childhood are : infections such as malaria, diarrhoea, pneumonia and tuberculosis. Low birth weight and subsequent malnutrition also contribute to this mortality. Maternal deaths most often are caused by haemorrhages (APH, PPH), toxæmia syndrome, prolonged obstructed labour and anaemia. Many of these deaths are potentially avoidable. The observation of a higher incidence of low birth weight during the wet season is associated with maternal malaria, heavy physical work and diminished food intake during pregnancy.

Whereas 4.7 % of the children suffer severe malnutrition, 76.0 % of the child population under 5 years of age have "normal" nutritional status or are mildly malnourished. The immunization status of children from the Medical Research Council villages, where the data were made available, is very good.

For villages where the population exceeds 400, in the High Impact Area (HIA) of Save the Children's Federation (SCF), Health and Medical Department and International Nutrition Communication Services (INCS), health care is delivered through trained traditional birth attendants (TBA) and village health workers (VHW), both of whom are voluntary workers. TBAs conduct the delivery whereas VHWs treat patients at their homes. The community health nurse (CHN) is responsible for the supervision of these two functionaries, but she has not been given the authority or means to actually treat emergency cases.

There is one weekly MCH clinic in the HIA which is quite popular.

For villages where the total population is under 400, health care services are delivered via local untrained TBAs. Except at weekly MCH clinics, there is no system in any of these villages to identify at-risk pregnant women. Moreover, the transportation of referred or emergency cases presents great problems.

Similarly, there is no system of keeping a surveillance on or monitoring nutrition and health status in these villages. Those who can reach the weekly MCH clinic are weighed and growth charts of children are made. No home visits are made by health functionaries.

a) In order to provide health and nutrition care to all women, newborns and infants and also to monitor their growth and nutrition status, it is recommended that a network of health agents consisting of members from women's groups, young girls, school-going children and literate persons from the community be formulated to assist the TBAs. In addition, all the TBAs in these villages, including the previously trained TBAs and nurses should be trained in the expanded activities of maternal and child health care and involved in the regular monitoring of mothers and children. The untrained TBAs should be involved in the expanded maternal child health (MCH) care and monitoring.

b) For these functionaries, simple and appropriate technology should be introduced. A pictorial home-based mother's record to monitor health-nutrition status, family planning, breast-feeding and health of the newborn up to 1 month of age has been prepared, discussed and tested among a few TBAs. All women should be given such a record after its pilot-testing and finalization.

For weighing newborns, a colour-coded weighing scale was tested. A colour-coded arm strip surrogate to birth weight was also demonstrated.

For assessing the degree of anaemia present, a coloured strip to match conjunctiva-tongue was shown and discussed.

c) The various health agents, TBAs, CHNs, CDAs, nurses, and doctors should be trained/oriented in the use of the technologies mentioned above. Guidelines for their use, interpretation of results and possible timely interventions should be prepared.

d) A simplified system of reporting data and recording information should be prepared. The health agents and other functionaries should be trained in this reporting and recording system.

e) The pictorial home-based mother's record and growth chart should form the basis of nutrition education. Locally available foods should be used to prepare nutrition supplements, meals or snacks.

COUNTRY PROFILE

The Gambia is a small west African country surrounded on the north, east and south by Senegal. It occupies the land area of about 11569 sq.km. The Gambia river divides the country into North and South Banks. Banjul is the capital.

People and population

A census conducted in April 1983 has estimated the population to be approximately 0.6 million. In Gambia there are five main ethnic groups and several minorities. The population density is quite high, with an average of 148 persons/sq.km. on dry land. The literacy rate in the country is very low and literate women are very few.

Climate

The climate of The Gambia is of the drier tropical type, characterized by a short and intense rainy season (wet season) between June and October and a longer dry season. During the wet season, there is a shortage of food.

Natural resources

The Gambian river provides the main source of water for irrigation, farming and domestic purposes. The Atlantic Ocean and the Gambian river are sources of an abundant supply of fish. Although

not well developed, forests provide various products which are widely used. The Gambia is primarily agricultural. The country's economy is based on the production of peanuts for export. Although beekeeping is not particularly valorised in some parts of the country, honey is nevertheless produced in the large part of the country and it is widely used as a sweetener and also as a therapeutic agent.

Transport

There are no railways or internal air services. There is one good port at Banjul and a small international airport at Yundum. For communication between the North and South Banks, ferry services are operating. A large area of the country suffers from a lack of transport services.

Administration and social conditions

The Gambia is an independent republic. The government is headed by a President. Elections are held every five years. The Vice-President and cabinet members are appointed by the President. The Gambia is split into five divisions, namely: Western, Lower River (South Bank), North Bank, Mac Carthy Island and Upper River. The divisions are further divided into districts and villages. The head of the division is a commissioner, who is appointed by the President, and the head of the district is a chief elected by the people. The local administration of each of the 35 districts constituting The Gambia is managed by the local chief, who is assisted by the village heads and advisers. The administrator of the village is called the Alkalo.

Health services: Structure, facilities and personnel

For health services, the country is divided into three areas: eastern, central and western. There are a number of health centres, dispensaries and two general hospitals: The Royal Victoria Hospital in Banjul and another hospital in Bansang. Both the hospitals are located on the South Bank. A few doctors have private clinics and nursing homes in the South Bank. There is a marked shortage of doctors and nurses and other paramedical personnel in the country and this is particularly the case for the North Bank. Health services are delivered through the Ministry of Health and non-governmental organizations. Although christian missions have founded some clinics and dispensaries on North Bank, this area suffers a greater lack of health services than South Bank. Chinese doctors, with the assistance of missionary nurses run the clinics at Ferrafeni and Illiasa, and there are some other clinics run by mission nurses, but they are inaccessible because of the long distances, lack of transport and the limited opening hours of the clinics which coincide with the working hours on the farms. The British Medical Research Council has its research unit in Kenneba and provides curative treatment in their field area of villages.

Recently, the primary health care approach has been introduced in the country, but many villages, particularly small ones, are not yet covered. The Primary Health Care Unit of the Ministry of Health has trained traditional birth attendants (TBAs) and village health workers (VHWs). The TBAs are trained in conducting safe deliveries and care of newborns. The TBAs and VHWs are responsible for the hygiene, sanitation and provision of safe drinking water in their areas of services. VHWs stock and dispense a few medicines useful for the treatment of common ailments.

MATERNAL AND INFANT HEALTH AND NUTRITION SITUATION AS STATED IN THE PROGRAMMATIC BRIEFING

For over a decade, the British Medical Council (MRC) has conducted a longitudinal study on nutrition with special focus on the relationship between the nutritional status of pregnant or lactating women and birth weight and lactation. The field area of the study is the village of Kenneba. It has been observed that 28 % of Kenneba babies are born with low birth weight (birth weight less than 2.5 kg) during the monsoon season when a drop of 100 to 250 g below the mean birth weight of 2.9 kg is common. In the dry season, only 12 % of the newborns are low birth weight. The fall in birth weight has been attributed to the most prevalent infections such as malaria and other infectious diseases, heavy work of women, low availability of food, lack of adequate medical support services, multiple pregnancies, short birth intervals, teen-age pregnancies and traditional beliefs/customs about pregnancy and diet. The introduction of a high caloric supplementary diet in a form of 3-4 biscuits (concentrated in nutrients but imported) a day to pregnant women raised the birth weight by 250 g. The incidence of low birth weight dropped to 4.7 percent. The babies of mothers who received supplementary biscuits tended to have higher growth curves than babies of unsupplemented mothers.¹

The MRC has documented the maternal mortality rate of 37.5, which is unbelievably high. A Peace Corps volunteer (non-medical) has noted that 38 % of the babies born to 217 women in her village died shortly after birth.¹ It seems hardly likely that 75 % to

almost all of infants should die within their first year of life in a community and it is probable that the data presented have been collected, synthesised and/or interpreted wrongly.

At Kerawan, North Bank Divisional Headquarters, a nurse has reported an average birth weight of 2.5 kg. This figure is based on mothers' reports.²

The incidence of anaemia, below 8 gm %, was observed in 20 to 30 % of women in the Ferrafeni area.¹

SAVE THE CHILDREN FEDERATION'S HIGH IMPACT PROGRAMME

The Save The Children Federation (SCF) has selected a ten-village area with the population of about 8,000 in the Upper Baldi Administrative District where it is providing technical support in terms of resources and process-oriented training since the fall of 1984. The villages selected are compatible with the Government of Gambia's concept of "key villages", which comprise two or three main villages with a cluster of satellite villages.

Each village has a TBA and some have VHWs.

The International Communication Service (INCS) provides technical assistance to back-stop the project.

THE GAMBIA MEDICAL HEALTH DEPARTMENT, SCF AND INCS MATERNAL
NUTRITION EDUCATION PROJECT

The collaborating agencies for maternal nutrition education project in The Gambia are: Save the Children Federation, Gambia (SCF), The Gambia Medical Health Department and the International Nutrition Communication Service (INCS). The goals of this project are :

- . The improvement of maternal nutrition during pregnancy among low-income Gambian mothers, particularly during the June-August season, and the subsequent improvement of overall pregnancy outcomes;
- . reduction in the incidence of low-birth-weight babies, particularly during the critical rainy season period;
- . changes in attitudes regarding the importance of dietary supplementation to pregnancy outcome, particularly during the rainy season and during the last trimester of pregnancy (among pregnant mothers themselves and in the community as a whole).

OBJECTIVES OF THE INCS ASSISTANCE

To fulfill the goals of the maternal nutrition education project in The Gambia, the objectives of the INCS are :

- . development of a low cost supplementation strategy, based on local foods for pregnant mothers in the last trimester of pregnancy, particularly during the rainy season;

training of TBAs, VHWs and other community-based specialists to record birth weights, pregnancy outcomes (and possibly monitor weight gain during pregnancy);

development and dissemination of a supportive communications strategy to promote behavioural change and improved dietary practices;

development of appropriate labour-saving devices to help reduce women's energy expenditures during the rainy season.

OBJECTIVES OF THE CONSULTANT'S ASSIGNMENT

Within this context, the author of this report visited The Gambia with the following objectives :

1. to develop a monitoring system to measure birth weight outcomes and nutritional status during pregnancy;
2. to design a communication mechanism to reach mothers and expecting mothers who have a low level of literacy.

HEALTH AND NUTRITION SITUATIONS BASED ON RECENT INFORMATION AND OBSERVATIONS

From 24 September to 11 October 1985, the consultant visited various places in Banjul and about 15 villages, spending 42 % of her time in the rural area. During this period, visits were made to the

maternity and children's sections in The Royal Victoria Hospital, three health centres (Essau, Illiasa and Ferrafeni), two MCH clinics (Illiasa and Ferrafeni), and two dispensaries (Ndugu and nearby another village). The author met with officers of Save the Children Federation (at Banjul and Kerawan), USAID (Banjul), UNICEF (Banjul), the Divisions of Primary Health Care and Nutrition in the Medical and Health Directorate of the Ministry of Health, Banjul; and held discussions with six nurses/midwives, four trained TBAs and two untrained TBAs, a community development assistant (CDA), pregnant women, two groups of school-going children and a group of youngsters. She observed a delivery conducted by a trained TBA and weighed newborn babies using a colour-coded weighing scale. (Annex I)

Reliable health and related statistics of the entire country are not available. USAID has compiled some useful data in April 1982 (Table 1)². This data is not recent; for example, the information on infant mortality rates is that of 1973, when 43.7 % of the children died before they reached the age of 5 years.³

TABLE 1

HEALTH STATUS IN THE CAMBIA

Infant mortality rate	217
Crude mortality rate	23
Birth rate	48
Life expectancy at birth	41 years
Population under 15 years	46 %
Hospitals in the country	2
Health care budget :	
salaries	70 %
equipment and drugs	16 %
administration	14 %
Immunization status (children under 3)	
DPT 3 doses	28 %
BCG	32 %
Measles	5 %
Access to safe drinking water	12 %
Major causes of infant and young child deaths :	
malaria, measles, diarrhoea	

Source : USAID, April 1982.³

Multi-variate analysis of concurrent longitudinal data from the MRC villages showed a huge burden of infectious diseases during early childhood. Diarrhoea was shown to be the major non-dietary cause of growth faltering, roughly halving the expected growth rate of children under the age of 3 years. These findings were documented from the community where comprehensive therapeutic services and childhood immunization programmes were provided by MRC.⁴

The other major disease which led to growth faltering and anaemia was malaria.⁵

The recent survey (August 1985) on the nutritional status of children under 5 years in five villages of the High Impact Area (HIA) revealed severe malnutrition in children varying from 0 to 8.9 % (mean 4.7 %) and normal nutrition or mild malnutrition varying from 63.6 % to 98.5 % with a mean of 76.0 %. Table 2 shows that malnutrition is not the major cause of child death in the community.⁶

TABLE 2
NUTRITIONAL STATUS OF CHILDREN UNDER 5 YEARS OF AGE
ILLIASA CIRCUIT - CENTRAL REGION⁶

Village	No of children	<u>Weight for height grouping: % children</u>		
		Green	Yellow	Red
Illiasa	157	87.3	11.5	1.3
Jumansar Ba	100	67.0	17.0	6.0
Alkali Kunda	139	66.2	27.3	6.5
Yallal	67	98.5	1.5	0.0
Katchang	247	63.6	27.5	8.9
Overall in 5 villages	832	76.0	19.4	4.7

Over a year, the mean daily energy and protein intake of pregnant women in MRC villages was 1453 Kcal and 45.6 g and of 1660 kcal and 53.0 g for lactating mothers.⁷ The intake was only 65 % of the WHO/FAO recommended intake, and it is surprising that the women were able to achieve positive energy balance and relatively satisfactory outcome of pregnancy and lactation during the dry season.⁴ During this season, and in the case of women who were previously in positive energy balance despite an energy intake of only 60 % of the recommended dietary allowances, the supplementation had no beneficial effect on the birth outcome.⁸ During July–September, maternal energy consumption decreased to 1350–1450 kcal per day among pregnant women and to 1200–1300 kcal among lactating women. The mean birth weight decreased to 2.75 kg and 35 % of infants weighed less than 2.5 kg at birth. Breast milk output showed a 40 % decrease during the wet season.⁹

Maternal weight gain and the accumulation of subcutaneous fat were significantly lower when the last trimester of pregnancy occurred during the time of heaviest farm work (July–September period) and lower energy intakes.¹⁰

During the dry season (January–April), lactating women were active 85 % of the 15-hour working day. At the start of the farming season, in June and July, this figure increased to 92 %. Similarly, changes were observed in pregnant women whose activity increased from a mean 50 % in April to 83 % in June. The period of intense activity coincided with a general shortage of food and increased incidence of diseases.¹¹

The casual role of malaria in low birth weight is considerable. All the newborns weighing less than 2500 g had maternal pigmentation of placentas. The pregnant primigravidae had the highest incidence (67 %) of malarial pigmentation of their placenta. First-born babies with pigmented placentas had a mean birth weight of 2.58 kg, which was significantly lower than 3.15 kg of unaffected first babies.¹²

The infant and maternal mortality rates of four MRC villages, representing a total population of 12000, in 1984-85, were 142 and 18 respectively and crude birth rate was 43. In these villages, health care is provided by MRC. Over 90 % of the infants have growth charts and 76 % of these children have received three doses of DPT and measles. 72 % of the children received 3 doses of polio vaccine and 98 % of them were vaccinated with BCG.¹³

About 23 % of the children in the age group of under 7 years died in the first month of life. The major causes of death in the post-neonatal period were diarrhoea, acute respiratory infections, tuberculosis, malaria, and meningitis. The most common causes of maternal deaths were ante-partum (APH) and post-partum (PPH) haemorrhage and eclampsia.¹³ In these villages, 90 % of pregnant women received prenatal care, most of them only once. 84 % of women were adequately immunized with tetanus toxoid. Western types of infant feeding bottles and commercial infant food products were virtually unknown in these villages.

From the discussions with two obstetricians, a paediatrician and nurses at the hospitals, health and MCH centres, the following information was gathered :

APH, PPH and eclampsia were the major causes of maternal deaths. Hospital admissions to maternal wards were frequently for caesarean sections, ruptured uterus and hand-prolapse. Many cases were found to be associated with severe anemia. The obstetricians are of the opinion that maternal deaths and hospital admissions can be reduced if some screening system with built-in necessary interventions for the at-risk women is introduced in the community.

According to the paediatrician, the causes of low birth weight are maternal malaria, eclampsia and other maternal infections. The nutrition of most of the mothers of these low-birth-weight babies was quite good, but few were malnourished and anaemic. The obstetricians thought that teen-age pregnancies, multiparity and shorter birth intervals were the factors responsible for low birth weight. Hardly 5-10 % of eligible couples use any family planning aid.

The nurses at health centres observed an average birth weight of above 3 kg. The consultant could go through the confinement register and found recorded birth weight of 3.0 to 3.2 kg of 50 newborns. The average pre-pregnancy weight and pregnancy weight gain, as observed by nurses was 48-50 kg and 8-10 kg respectively.

THE HEALTH CARE DELIVERY SYSTEM IN THE HIGH IMPACT AREA

Primary health care

The country has adopted the primary health care approach for achieving the goal of health for all by the year 2000. However, the implementation of this approach has been a slow process. Throughout the North Bank area a number of villages (about 50 to 60) whose individuals exceed 400 have been selected for the implementation of the primary health care approach. Each of these has :

- i) trained TBAs with 4 weeks training
- ii) trained VHWs with 6 weeks training.

Drugs are procured by the Community Pharmacy from regional medical stores. The drugs (chloroquin, aspirin, penicillin tablets, alludrox, piperazin, and gentian violet paint) are kept with VHWs. TBAs are provided with the UNICEF kit which also contains tablets of ergometrin and iron with folic acid. Although VHWs and TBAs are not paid by the government, their services are recompensed in food donations by the community. From what the consultant could see, the VHW provides curative services and refers cases who do not respond to treatment within 48 hours. He uses a pictorial reference sheet. Most of the time he is on his farm and villagers have to wait a long time for a consultation and treatment. He does not make domiciliary visits, nor does he weigh the children. Most of the VHWs are male and non-literate. In rural areas, pregnant women do not like to get

examined by male VHWs. It has been reported that some VHWs join the MCH team in weighing children at the MCH centre in HIA.³ Only the weighed children who have attended the MCH clinic have been given growth charts. The mobile team makes weekly visits which are often irregular due to the breakdown of transport or a shortage in the supply of fuel.

The knowledge and performance of the trained TBAs were considered satisfactory by the consultant, whose judgement is based on discussion and observation of TBAs in their activities. The officials in the Ministry of Health expressed doubt regarding the TBAs' capacity to shoulder any additional health assignment due to their heavy workload. However, the TBAs themselves showed considerable enthusiasm and interest to assist in the pictorial monitoring system for women's health during a briefing session. The training and work of the TBAs is centred mostly around village sanitation, community development and the conduct of safe deliveries. They are not trained to monitor the health and nutrition of women and children.

Villages with a population of less than 400 are served by local untrained TBAs, and in case of emergencies, the community finds it difficult to get the right kind of help as people have not yet developed confidence in trained TBAs and, whenever possible, they prefer to go to the primary health centre located at a distance of 3 to 6 km.

The TBAs and VHWs are supervised by the community health nurse (CHN). The CHN lives and works out of "key" PHC villages. She is

responsible for the referral of cases to VHWs or to the dispensary for treatment. She does not actually treat patients and is not allowed to store medicines. She has an 18-month training following a 10-year schooling period. The CHN at Illiasa monitors five villages and supervises each VHW and TBA at least once a week. She has been provided with a motor cycle, and is paid by the government.

First referral level

The first referral service is manned by a dresser/dispenser who works with a nurse or midwife, CHN, and in some cases a health inspector. This level of service has an access to more sophisticated treatment, but there is no laboratory. However, such centres are not in the High Impact Area, but in Ferrafeni which is at a distance of 8 to 35 km.

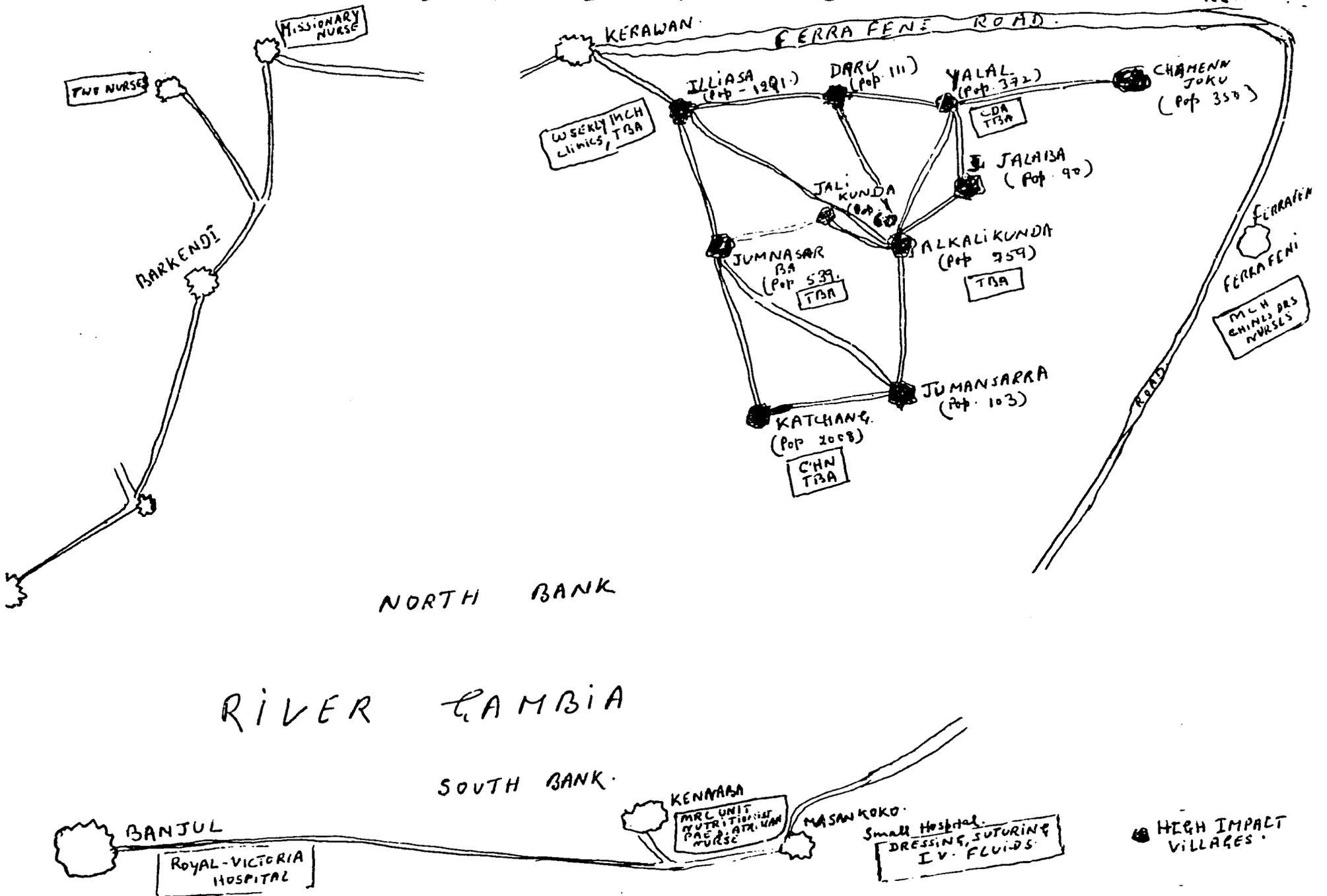
Second referral level

The second referral level is the health centre with the same staffing set up as that of first referral level, but in addition it has maternity beds. Such a centre also is not in the HIA, but in Ferrafeni.

Tertiary referral level

The country has two hospitals in Banjul and in Bansang, which form the apex of the health services. There are also some private practitioners who are settled in South Bank.

VILLAGE AND HEALTH INFRA STRUCTURE IN HIGH IMPACT AREA.



To reach the tertiary referral level in the South Bank, the patients have to cross the river. The ferry services are not frequent and do not operate between 8 p.m. and 8 a.m.

The primary health care team collaborates with MCH and/or EPI team members and vaccinates children. There are programmes on oral rehydration in MRC villages.

The total population in 10 villages of HIA is 5682. Map I describes village population and health services facilities.

There is no system of monitoring women's health and nutrition. Pregnant women are weighed at MCH centres when they visit the centre on an average of 1 to 3 times during the pregnancy period, but most of the women attend MCH centres only in the last trimester of pregnancy.

Six villages in the High Impact Area have no trained TBAs or VHWs, as their population is under 400. They make about 19.2 % of the population of HIA. However, there are untrained TBAs who conduct the deliveries.

THE HEALTH-NUTRITION PROBLEMS AS PERCEIVED BY THE CONSULTANT

Scientific health data in The Gambia as reported by the MRC team are based on the investigation undertaken in four villages. The council has been operating for over a decade and provides health

care to the community. From these sets of data, and other information gathered by the consultant in the country, it can be summarised that the infant, pre-school and maternal mortality rates are staggeringly high. As mentioned earlier in the report, the most common causes of infant and child deaths (1-4 years) are infections such as diarrhoea, malaria, acute respiratory infections and tuberculosis and malnutrition. The latest survey on nutritional status of the under-fives revealed that 76 % of the children have normal nutrition or mild malnutrition and only 4.7 % had severe malnutrition. This shows that the incidence of severe malnutrition is of some concern, but that the vast majority of children have a normal nutritional status. In such situations, the causal factors determining severe childhood malnutrition are not only the lack of food but nutrition-related factors such as infections.

The observations of the MRC on the relationship of heavy physical work during pregnancy, diminished food intake due to shortage and poverty with birth weight is of significance. The council has reported a higher incidence of low birth weight in the wet season. However, these findings should be seen in the light of other reports from the MRC, where it has been observed that 67 % of the placenta of the first-born babies had malarial pigmentation. The weight of these newborns was significantly low at the level of 2.58 kg. Moreover, the placenta of all newborns who weighed less than 2.5 kg at birth had malarial pigmentation.

The obstetrician, nurses and paediatrician opine that the incidence of severe malnutrition in the Gambian women is low and that the mothers of the low-birth-weight babies are frequently not

nutritionally different from those who deliver babies weighing 3.1 or 3.2 kg. According to them, teen-age pregnancies, short birth intervals, eclampsia, severe or moderate maternal anaemia associated with malaria contribute to low birth weight. Hence, the various available reports and observations point out that lower nutrition intake during pregnancy is not the only factor leading to high incidence of low birth weight.

SOCIO-CULTURAL FACTORS INFLUENCING THE HEALTH AND NUTRITION OF MOTHERS AND CHILDREN

In the focus group discussions with mothers and members of the Gambian Women's Association, it was revealed that women and children have their own life-style, behaviour patterns and position in the Gambian society. According to culture particularities, the women have a considerable burden of responsibilities, such as working in the field, pounding, cooking, fetching water, caring for children and other domestic chores. Polygamy is common and, on the average, a man has two or three wives. Each wife competes with the other wives and, in order to keep the husband pleased, has to work hard and show her womanhood by producing a greater number of children. They feel very insecure and suffer a constant threat of divorce which they avoid by adopting certain behaviours, some of which have become integral part of the culture.

Men enjoy preferential treatment in their eating habits. The women do not disclose their pregnancy for a few months. Pregnant women may not like to get examined by a male health worker.

The youngsters, both male and female, school-children and members of the women's groups expressed their desire to cooperate and assist in bringing about changes that benefit infants, children and women's health and welfare.

POTENTIAL AGENTS OF HEALTH NUTRITION CARE DELIVERY IN THE HIGH IMPACT AREA

The consultant considers that, due to the limited health personnel in the HIA, and the job descriptions of the VHWs, which centre around a clinical approach and curative services, the accessibility of mothers and children to MCH clinics is restricted. This is further compounded by the women's workload in the farms and at home, long distances to the clinics, lack of timely availability of transportation, shortage of fuel and other such factors, so that the health and nutrition care of women and children will be possible only through some alternative approaches in the context of primary health care. Involvement of the people themselves, particularly the women, young girls and school-age-children, in self-diagnosis and initiation of timely intervention and self-care is very important. The community in the HIA should be motivated to use its own resources such as TBAs trained and also untrained, women's groups either formal or informal, and youngsters. The present assignments of VHWs are centred around curative care and village sanitation, and the vital MCH activities are not well represented at all. They dispense medicines and spend limited time in their health work. At present, they do not make home visits. The trained TBAs who conduct

deliveries and provide care for the newborns are potential health agents for the expanded activities related to nutrition and health of mothers during pregnancy, labour, post-partum and inter-pregnancy periods and of newborns and infants. The present untrained TBAs are capable of taking up these assignments if they are offered some training. However, for their expanded role, the TBAs should be supported with supervision by the nurses and rewarded in kind or cash for their additional work.

Most of the health agents who will be involved in the delivery of health care are non-literate and, hence, should be provided with simplified appropriate technology for monitoring the health and nutrition of women and children. The technology in pictorial form should indicate to the health agents, mothers and community members, whether a woman is at risk and needs some intervention and, consequently, how to arrange the patient's referral to a nurse or to the hospital or how he/she should be managed at home. The women should not only be monitored during pregnancy and labour, but also during the inter-pregnancy periods. Frequent contacts in between pregnancies have great implications for the maintenance of health and nutrition, sustaining a rapport between the health agents and the individual, and creating confidence for health, nutrition, family planning education, and interventions. These contacts can also be utilized for monitoring nutritional status of women and children, immunization and other health activities.

Appropriate training in the understanding and use of simple technology for monitoring and diagnosis is an important element of health care.

Equally important is the formation of a network of community health agents and their articulation with nurses, CHN, CDA, health centres and MCH personnel.

This approach should be considered as an operational research with the potential feasibility of expanding to wider area of the country. An NGO can support the project in terms of remuneration, training and development of simplified technology. Mr. McDermott of UNICEF, Dr. Antony S. Nathe and Mr. Marena in PHC, Ministry of Health, appreciated and favoured the pictorial home-based mother's record and felt that this record could provide a useful teaching tool and generate community involvement. It could help in the detection of at-risk pregnant women very early. They are of the opinion that people from the community can be trained to help the TBAs and share a part of their work.

SUGGESTED SIMPLIFIED TECHNOLOGIES FOR MONITORING NUTRITION AND HEALTH OF WOMEN, NEWBORNS AND INFANTS

The most simplified technologies to monitor nutrition and health status of women during pregnancy, labour, delivery, post-partum period and inter-pregnancy period and of newborns and infants were discussed with TBAs, nurses and other interested health workers. The following are considered useful technologies for HIA in The Gambia :

TABLE 3

Technology	useful for	users
1. Pictorial home-based mother's health-nutrition record	women	TBAs, mothers, women and other groups. Nurses or literate persons for weighing and charting.
2. Adult weighing scale to assess nutrition of women	women	Nurses or literate person from the community.
3. Tool to monitor moderate or severe anaemia in mothers	women	TBAs, women or other groups.
4. Colour-coded weighing scale	newborns	TBAs, women and other groups.
or colour-coded arm-tape as surrogate for weight of newborns and infants	newborns and infants	TBAs, women and other groups.
or weighing scales and weight charts to monitor nutritional status of newborns and infants.	newborns and infants	Nurses and literate persons from the community.

1. Home-based mother's health-nutrition record (pictorial)

A comprehensive pictorial record to be used by mothers, family members, TBAs, etc., has been prepared for married women in their reproductive period to provide information on their health status, and identify whether they are normal or at risk (tick-mark in shaded area in front of risk factor). It also includes some other important items such as immunizational status for tetanus toxoid, breast-feeding, menstruation and family planning (Annex II). The

record stimulates or reminds the mother, TBA, family and community members to take action or seek timely advice/treatment from a nurse or a doctor.^{14,15,16} One or two items such as name and address are to be filled in initially by a nurse or literate person from the village. Most of the remaining items can be filled in by a non-literate TBA or someone from the women's group who has been oriented in the use of the card. There are a few items such as height on Panel 1, weight, B.P and haemoglobin on Panel 3, which are to be filled in by a nurse.

Information on the mother's previous pregnancy performance and risk factors, if any, are to be entered on Panel 1. If the woman is pregnant, the second Panel of the folded card is used during the period of pregnancy. This Panel can contain columns for two or more pregnancies. The record should be completed every month. Panel 3, as mentioned earlier, is to be filled in by the nurse. The weight is plotted on the graph against the month of pregnancy. The nurse or a literate woman in the village will weigh the pregnant woman every month. There will be about 120-125 pregnant women at a given time in 10 villages. Two weight curves depict the weights during pregnancy. The women whose weight trend follows the direction of the weight line near the upper curve are likely to deliver babies of 3.1 kg or above. Whereas, those whose weight is near the lower line are at risk of giving birth to low-birth-weight babies. The position of these two curves is to be adapted for Gambian women. These lines and weight curves are included on the card in order to educate the woman and her family members in the importance of attaining weight gain between the two lines to ensure that the baby will have good birth weight.

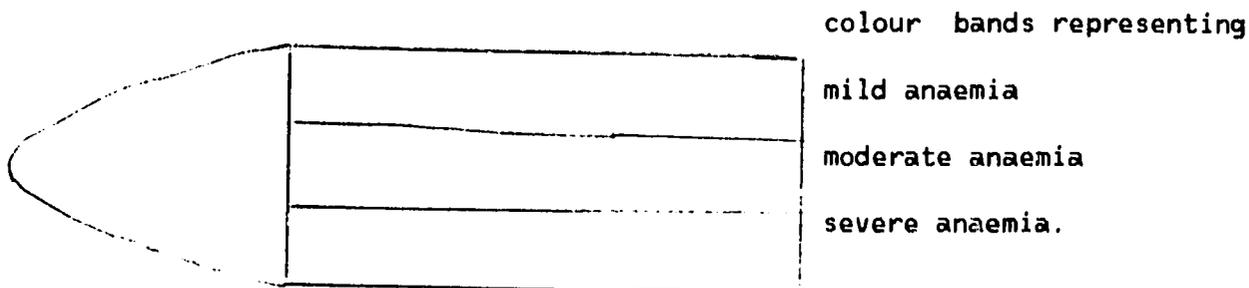
The information regarding labour, delivery and the newborn can be filled in on Panel 4. As this record monitors health and nutrition of women throughout their reproductive period, Panel 5 is an important one. Here, information on health before the first pregnancy and during the inter-pregnancy period is recorded. Panel 6 has information on referral, which is to be filled in by a literate person, nurse or doctor.

In all, the married women between 14 to 45 years of age in the HIA will account for 20 % of the total population and all of these should have their records for monitoring and action. The record needs to be pilot-tested before being printed on a thick card. Guidelines on how to adapt and use the record should be developed.

2. Tool to monitor grades of anaemia

Severe anaemia in pregnancy is one of the major causes of maternal deaths and low birth weight. It is possible for TBAs or members of women's groups in the field to estimate severe, moderate and mild anaemia without taking blood sample. A simplified scale with three shades of red^{16,17} or coloured photographs can be used to diagnose various grades of anaemia. The health agent can decide the line of action to be taken for the various grades of identified cases of anaemia.

Fig.



3. Colour-coded weighing scale to monitor weight of newborns and infants

This weighing scale is a handy instrument being slightly bigger than a pentorch (Annex III). The scale has weights marked in figures as well as in three coloured bands. The latter indicate weights below 2000 g, above 2000 g to below 2500 g and 2500 g and above. The colour coding simplifies the grading of newborns according to their weight for non-literate TBAs.¹⁸ With this scale infants up to the age of 1 year can be weighed. One such weighing scale was handed over to SCF by the consultant.

4. Colour-coded arm-tape as surrogate for weight of newborns and infants

In the case of non-availability of the above weighing scales, colour-coded arm-tapes could be used to monitor newborns and infants. This technology is based on the experience that there is a

relationship between weight and subcutaneous fat and muscle mass. This technology is being field-tested in a number of centres. The arm-tape has colour coding similar to the one on the weighing scale described above.

5. Weighing scales and weight charts to monitor nutritional status of newborns and infants

The salter weighing scales and growth charts are being used in The Gambia. This can be extended to all ten villages of HIA to monitor all the newborns and infants. However, it will involve weighing and recording the weights by literate persons from the community or by nurses.

Village delivery huts

A considerable proportion of maternal mortality and morbidity is linked with delivery. In villages, deliveries are conducted in the huts where hygienic conditions are precarious. The at-risk cases are not identified and at the onset of the labour the relatives decide to go to hospital, but transport is slow and if this occurs at night, it may be virtually impossible to cross the river to reach the hospital in time.

One simple hut should be constructed in the village which should be under the care of the TBA. At the time of delivery, the woman should be taken to this hut and the TBA should conduct the delivery safely for the mother and her newborn.

Another hut for at-risk cases should be constructed near Ferrafeni. A trained TBA should be made in charge of this hut. At-risk pregnant women can be admitted about a week before the expected delivery. The trained TBA should keep the woman in observation and doctors and nurses at Ferrafeni should be informed, so that, whenever needed, their help can be sought. If at the time of the delivery she is to be referred to the hospital in Banjul, it will be nearer and easier to cross the river and reach the hospital in time. A kitchen garden can be cultivated around the hut where these pregnant women, whenever possible, can work and obtain fresh vegetable and fruits for their own consumption.

Training/orientation of health agents

All those who are involved in the monitoring of health and nutrition activities should be trained. These agents include trained and untrained TBAs, women's groups and other groups, VHWs, nurses, CHN and CDAs. Recently, the primary health care unit has trained the TBAs. However, this training needs to be supplemented with further orientation on the problems of pregnancy, child care, family planning, and monitoring of nutrition and health. The training should also include information on common diseases, diagnosis and relevant actions to be taken for their management. The duration and content of the training will vary according to the functions of the health agents and their background and knowledge of the subject.

The guidelines on the use of simplified technologies described earlier should be prepared. Such guidelines with various pictures

will be useful for the trainers of the non-literate TBAs and community groups. Training should be complemented with practical exercises on the techniques and demonstration of the methods. The cases suffering from common diseases, if available, should be shown to the trainees.

Formation of a network of community health agents and their articulation

All the untrained TBAs of the 5 small villages in the HIA should be trained and linked with CHN and also with VHWs. Trained TBAs are already working closely with the CHNs.

Villages where the TBA (trained or untrained) is unable to undertake the additional assignment of monitoring and treatment of anaemia and malaria or if she is very old in age and not able to move in her own village or to the CHN's village, a group of enthusiastic women should be trained to undertake these jobs. Wherever possible, a group of women, young girls or school-children who are interested in undertaking health activities should be encouraged to do so if most of the community has confidence in them.

The literates in the village should be involved according to their interest in filling the records, weighing or in assisting the CHN and the CDA.

Hence, the CHN in the HIA becomes the most important health person. She will be one of the main trainers and supervisors. It is imperative that the CHN keeps medicines for helping the at-risk

and emergency cases in time if such help is not available to the needy. She should possess the monitoring tools which will be useful in training and supervision.

The community may be involved in helping to arrange transportation and social support to the patient and her family.

For any additional assignments the health agents, TBAs and CHN who will be involved in health and nutrition monitoring and taking actions should get some remuneration.

The health functionaires—staff of other NGOs such as SCF, Peace Corps and missions, at health or MCH centres, should be involved in training, data collection and analysis.

The nurses at the MCH centre and doctors at the hospital in Banjul need to be oriented in the use of technology such as the home-based record and the risk approach.

Health and nutrition education should be imparted through home-based records of women or children (growth chart) as well as information on the diseases prevalent in the village. The nutrition supplementations should be composed of the foods locally available such as ground-nuts, millet, fish and honey. The preparation should be easily made at home and acceptable in form and taste.

COMMUNICATION MECHANISM

With the creation of a network of health agents and with the active involvement of the community, there will be an appropriate communication mechanism able to reach almost all mothers and pregnant women with a low level of literacy. This mechanism will help in reaching those who have remained unreached until now. It will also improve the quality of care and monitoring of newborns and infants.

RECOMMENDATIONS

1. Limited scientific information is available on health and nutrition problems which contribute to the extremely high mortality rates of infants and mothers. From some reports it can be summarised that malnutrition during pregnancy and low birth weight of infants are common causes. But it seems that there are some other equally important or perhaps more prevalent conditions which contribute to these high mortality and morbidity rates in the community. It is recommended that scientific information be collected on the possible causes of deaths in the community in areas other than the one which is served by the MRC.

2. There is a shortage of health personnel who can look after pregnant women, conduct safe deliveries and care for newborn infants. Many of those who need health care are either not able to reach the health post or hospital in time, or the health personnel are not mobile and do not make domiciliary visits, or they are not

available beyond their fixed working hours. A network of health agents should be formulated in the HIA. Women's groups, young girls, school-children and enthusiastic literate persons from the community should be identified and involved in health and nutrition care, monitoring of nutrition in women and children, and filling in the home-based mother's record and growth charts. Each village should have such health agent/s.

3. All the TBAs (trained and also untrained) should be oriented in care during the antenatal period, labour, post-partum period and care of newborns. They should also be trained in the use of the pictorial home-based mother's record' and the colour-coded weighing scale.

4. The pictorial home-based mother's record should be pilot-tested before its finalization and printing. Similarly, colour-coded weighing scales or colour-coded arm strips and coloured strips or photographs to match with conjunctiva/tongue to assess the grade of anaemia should be pilot-tested and adapted.

5. Guidelines for trainers, nurses and literate health agents on the use of the pictorial home-based mother's record, weighing scales and growth chart should be prepared.

6. The home-based mother's record includes a weight chart for the period of pregnancy. All those who have this record should be weighed preferably every month by CHN, CDA or some literate community agent.

7. The newborns should be weighed and the growth chart should be prepared.

8. The communication mechanism mentioned in point 2 above should ensure that all the women, including the pregnant ones and their newborns, are under surveillance. These women and their family members should receive nutrition and health education, and should be cautioned to minimize heavy work during pregnancy and advised on eating habits. The supplementary food items should be prepared at home using foods available in the villages.

9. To improve the coverage of pregnant women with tetanus toxoid, health agents should be informed to keep surveillance and referral of women to the MCH clinic for the injections.

10. The CHN should possess medicines for use during emergencies. The TBAs and the community health agents should be provided with chloroquin tablets for malaria prophylaxis and iron folic acid tablets for treatment of anaemia. The health agents will ensure that the tablets are taken by the pregnant women.

11. Similarly, with the assistance of TBAs and other health agents, eligible couples should be advised and motivated into observing safe child spacing.

12. Two delivery huts should be constructed, one in a village and one at Ferrafeni. Later on, after experience, such huts should be constructed in all the villages for safe delivery.

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Stay in Bekendik for three days with Margueret Pettibone. She was with me throughout from 28 September to 8 October.

28 September, Saturday

Talked with school going children. Issues discussed:

- . Health problems
- . Role of youth club in prevention and promotion of health and nutrition.

Visit to mission dispensary at Ndungu Kebba. Met with Ms Jenefer Wymen, mission nurse.

Talked with Village Health Worker in Bakendik about his assignment and looked at the content of the VHWs box.

Visit to Health Centre, Essau. It has 8 bedded maternity ward; 2 bedded nutrition ward for children and 4 trained nurses work in rotation.

29 September, Sunday

Observed the trained traditional birth attendant conducting delivery - using UNICEF kit.

Talked with school going children.

Visited Mission Clinic in a small village where one Indonesian and one Swiss nurse are working.

30 September, Monday

Stay in Kerawan for three days (30th Sept., 1 & 2 October). Ms Patricia accompanied.

Visited local office of SCF, met with Dr Soloman (non-medical) Programme Manager, SCF.

Issues discussed:

- . Sanitation
- . Latrine construction
- . Workload during pregnancy

Met with Ms Bintou K. Jaitah, Community Development Assistant.

1 October, Tuesday

Visited seven villages of the High Impact Area

- . Jalikunda
- . Alkalikunda
- . Jalaba
- . Illiasa
- . Daru
- . Yallal
- . Karchang

Discussion with four trained and two untrained TBAs, and two pregnant women.

Talked with youngsters on working women.

Observed preparation of millet porridge.

Observed nutritional status of children and women in these villages.

Weighed four newborn babies in their homes.

2 October, Wednesday

Visited Illiasa to attend weekly MCH clinic. The clinic is conducted by Chinese team (however Chinese doctors did not come that day). Other staff: one mission nurse and two nurse midwives and one family planning nurse-midwife from regional medical team. The mothers and children come from 8 to 10 villages.

About 100-150 children under 7 years were weighed, vaccinated and examined, and about 50-60 pregnant women were examined.

Reached Ferrafeni.

3 October, Thursday

Met with Mr Robert Snow, Demographer, MRC.

Issues discussed:

- . Health and nutrition studies.
- Snow provided some recent data.

Visited MCH clinic, Ferrafeni. The Chinese team did not come today.

Met Sister Jammy who is attached to vocational training centre. She talked about her experience.

4 October, Friday

Visit Mansakonko Health Centre. It has facilities of intravenous fluid administration and suturing (Staff: doctor, nurses and sanitary inspector.) At the time of visit, these health personnel were not at the centre. Met two non-medical persons.

Visited Medical Research Council office, Keneba. Had discussion with Mrs Jena Singh, nutritionist and with the paediatrician.

Returned to Banjul.

5 October, Saturday

Discussed with Ms Patricia about the pictorial home-based mother's record, a technology to monitor health and nutrition of the women by non-literate TBAs and take action in time.

6 October, Sunday

Preparation of a pictorial home-based mother's record.

7 October, Monday

Visit to Royal Victoria Hospital, Banjul. Met with Dr Kurang and Dr Assadeh, obstetricians. (There are three obstetricians, few interns and few nurses in the department).

Meeting with Dr Jah, Regional Medical Officer, Mansakonko, Ministry of Health.

Issues discussed, in both these meetings:

Common causes of mortality and morbidity in women.

Preparation of pictorial home-based mother's record for use by TBAs: assistance of Margueret Pettibone and one of the CDA.

8 October, Tuesday

Visit to Royal Victoria Hospital, Banjul.

Met with Dr Judith Brown, paediatrician. (There are two to three doctors to help her. 50 bedded children's section in the hospital, always crowded with 100 to 150 children).

Met with Mrs Isatau Nogie, Women's Association, The Gambia.

Issues discussed:

- . Gambian women's status in the society.
- . Working load of the women.
- . Female circumcision, practices, type, attitudes and health problems.
- . Collaboration in health programme directed to benefit women and children.
- . Mother's health record system which involves her and community.
- . Delivery hut in a village.

Pictorial home-based mother's record completed and multiple copies made to field test before printing.

9 October, Wednesday

Met with Dr Oldfield, Director of Medical Services, Medical and Health, Ministry of Health.

Met Dr F. Gower in the same directorate.

Issues discussed:

- . Simplification of technology for monitoring health and nutritional status of women, newborns and infants.
- . Involvement of TBAs, VHWs and community.

10 October, Thursday

Visited UNICEF, Gambia and met with Mr Peter McDermott.

Issues discussed:

- . Pictorial home-based mother's record.

Visit to Health Ministry and met with Dr Anthony S. Nathe and Mr Marena, PHC training officers.

Issues discussed:

- . Pictorial home-based mother's record and involvement of TBAs, PHC workers and community.

11 October, Friday

Visited Royal Victoria Hospital, Banjul.

Met with Ms Ida Ceesy and briefed her about the simplified system prepared for monitoring maternal health and nutrition, outcome of pregnancy and health and nutrition of newborns and infants.

MOTHER'S HEALTH-NUTRITION RECORD

Name.....number.....
 Address.....
 Date of First Visit.....

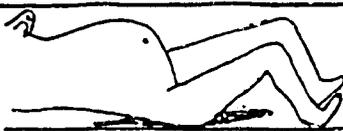
Age:	18 - 35	below 18	above 35
Height: 150cm	150 cm or above	less than 150cm	

PREVIOUS HISTORY :

	1	2	3	4	5	6
Number of Deliveries:	1	2	3	4	5	6
Abortion (last pregnancy) :						
Oedema:						
Fits:						
Stillbirth (last pregnancy) :						
Abnormal deliveries:						
Excess Vaginal Bleeding after Delivery.P.P.H.:						
Labour Lasting more than 24 hours :						
Low Birth Weight : (less than 2500 gm)						
Death of child :						

PRESENT PREGNANCY

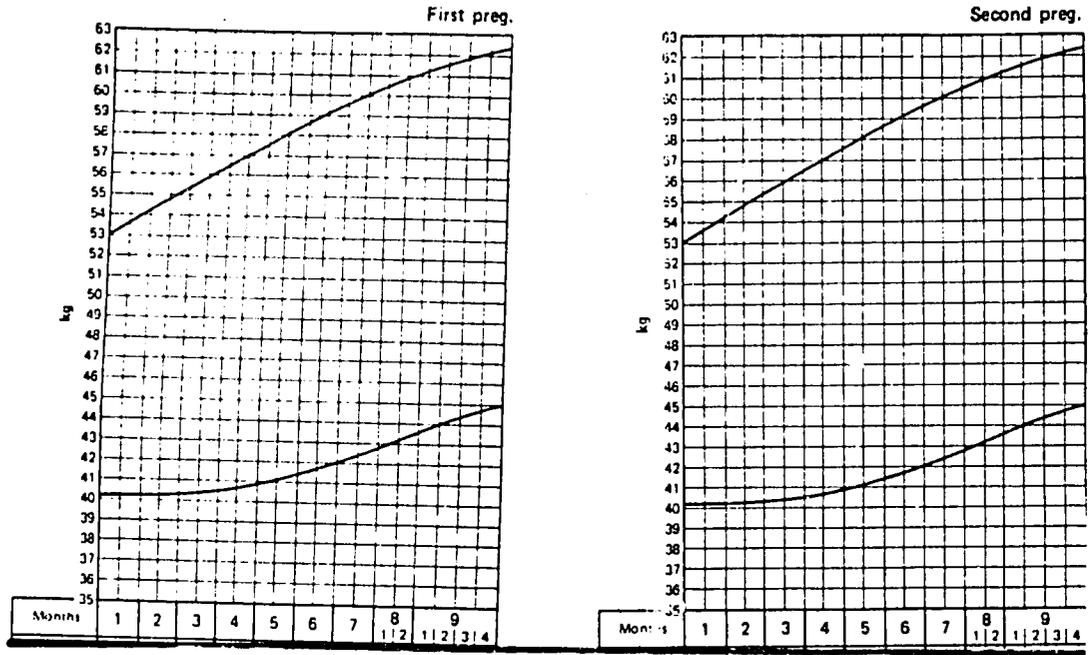
3 4 5 6 7 8 9 3 4 5 6 7 8 9

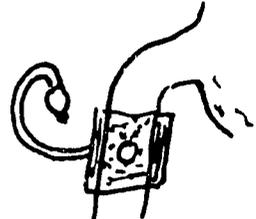
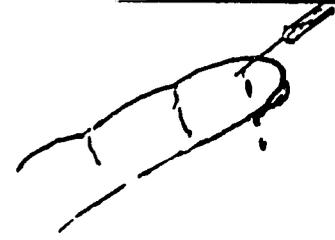
Severe pallor															
Pitting Oedema															
Vaginal Bleeding															
Very Thin															
Very large Abdomen															
Abnormal Presentation															
Weak Foetal Movements															
Malaria Treatment															
Chloroquin Prophylaxis															
Tetanus Toxoid									1st dose	2nd dose				1st dose	2nd dose
Food Advice															
Iron Folic Acid Tablets															
Advice on Place of Delivery.															

Home Health Centre Hospital Home Health Centre Hospital

OBSERVATIONS IN PRENANCY PERIOD

Weight



		3	4	5	6	7	8	9		3	4	5	6	7	8	9
S.P. above 140/90																
Haemoglobin below 8.																
Remark.																

LABOUR/DELIVERY.

4.

FIRST DELIVERY

SECOND DELIVERY

Duration



FIRST DELIVERY		SECOND DELIVERY	
NORMAL	PROLONGED	NORMAL	PROLONGED

Presentation



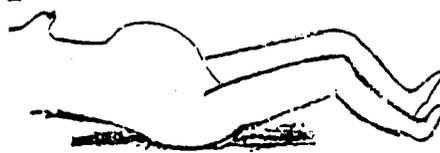
HEAD	OTHER	HEAD	OTHER
------	-------	------	-------

Type of delivery



NORMAL	OTHER	NORMAL	OTHER
--------	-------	--------	-------

Excess Vaginal Bleeding



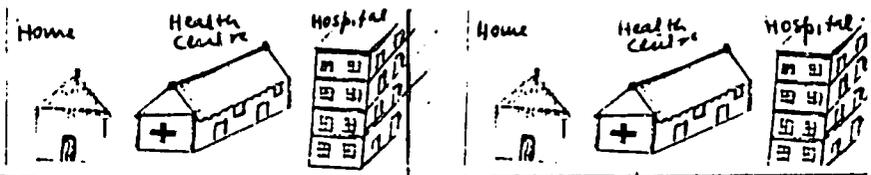
NO	YES	NO	YES
----	-----	----	-----

BABY

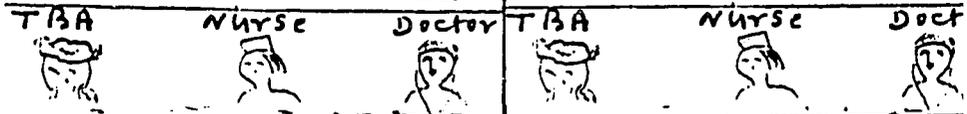
Sex Male Female Male Female
 ♂ ♀ ♂ ♀

Date of delivery.....

Place of Delivery



Conducted By

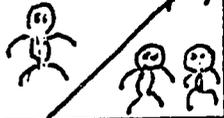


Duration of Pregnancy



More than 8 months	8 months or less	More than 8 months	8 months or less
--------------------	------------------	--------------------	------------------

Number of babies



Single	Twins or more	Single	Twins or more
--------	---------------	--------	---------------

Birth weight



2500gms or more	Less than 2500gms	2500gms or more	Less than 2500gms
-----------------	-------------------	-----------------	-------------------

Cry



Immediate	Delayed	Immediate	Delayed
-----------	---------	-----------	---------

Breathing difficulty

NO	YES	NO	YES
----	-----	----	-----

Condition of baby



Alive	Still Born	Died in 7 days	Died 7-28 days	Alive	Still Born	Died in 7 days	Died 7-28 days
-------	------------	----------------	----------------	-------	------------	----------------	----------------

Breast Feeding



YES	NO	YES	NO
-----	----	-----	----

6.

REMARKS TO AND FROM REFERAL CENTRE;

Date	Problems Identified	Action Taken.

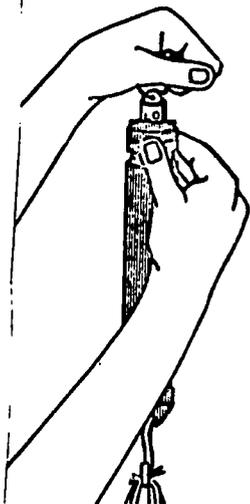
158

How to tare the scale: WEIGHT OF NEWBORN AND INFANTS. 19

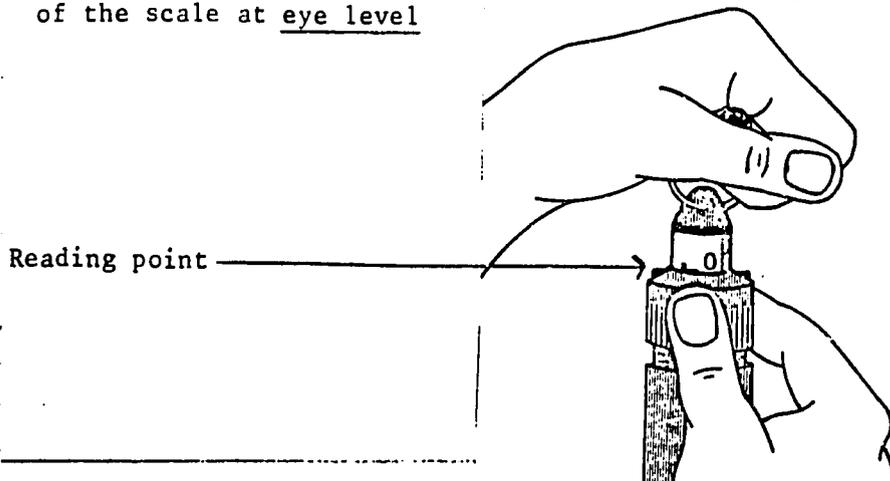
1. Place all four loops of the strings onto the hook of the scale



2. Push inner core of scale (part marked with measures) all the way in.



3. Slide the bar at the top of the scale between the middle and ring fingers of one hand, with the bar lying at the base of the fingers, then turn the hand keeping the bar in the same position, and hold the reading point of the scale at eye level



4. While the scale is hanging freely with sling attached, and keeping the reading point of the scale at eye level, turn knob until it's uppermost part is level with the zero mark at top of scale

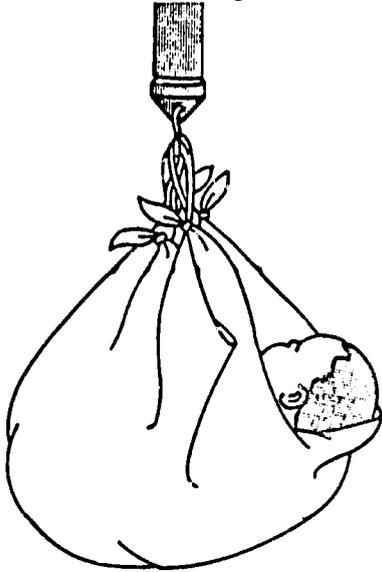


C. How to place the newborn baby in the sling:

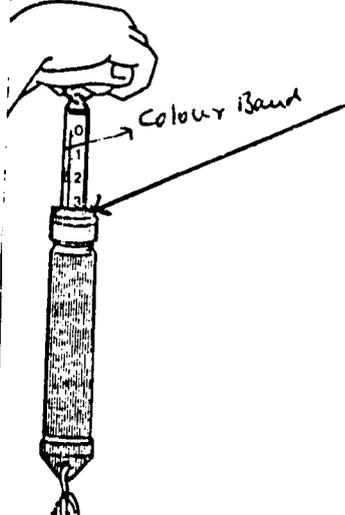


D. How to weigh the newborn baby:

1. Put all 4 loops of the string into the hook



3. Read the weight shown or the colour



2. If you cannot hold the scale still with one hand, use the second hand to steady it.
Note that the reading point of the scale is at eye level.

