THE EVALUATION OF A NUTRITIONAL SURVEILLANCE, GROWTH MONITORING AND PROMOTION PROGRAMME: AN OVERVIEW OF THE COVERAGE AND QUALITY OF THE SERVICES PROVIDED IN VIHIGA DIVISION OF KAKAMEGA DISTRICT.

by

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

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LIST OF ABBREVIATIONS

DIT	District Implementation Team
GMP	Growth Monitoring and Promotion
HCT	Health Centre Team
MOH	Ministry of Health
UNICEF	United Nations International Children Emergency Fund
NCHS	National Centre for Health Statistics
CDC	Centre for Disease Control
MCH/FP	Maternal and Child Health/ Family Planning
ORT	Oral Rehydration Therapy
GOBI	Growth Monitoring, Oral Rehydration therapy, Breastfeeding Immunization
CSRI	Child Survival Revolution Interventions
GTZ	Deutsche Gesellschaft fuer Technische Zusammenarbet (German Technical Co-operation)
IDRC	International Development for Research Centre.

NFW	Nutrition Field Worker
CO	Clinical Officer
EN	Enrolled Nurse
ECN	Enrolled Community Nurse
FHFE	Family Health Field Educator
ST	Statistical Clerk.
CHANIS	Child Health and Nutritional Information System
AID	Automatic Interaction Detection
MCA	Multiple Classification Analysis
RHTC	Rural Health Training Centres
HC	Health Centre
SHC	Sub Health Centre

TERMS USED IN THE STUDY.

The 'at risk' child:

Refers to that segment of the pre-school child population that is exclusively or largely subject to significant probabilities to developing malnutrition.

Programme coverage:

Extent to which the growth monitoring and promotion programme obtains target population participation as specified in its programme design.

Process evaluation:

Monitoring of programme procedures and activities related to target identification and delivery of the planned services.

Service delivery:

Procedures and organizational arrangements actually employed to deliver Growth Monitoring services to the pre-school child population.

Access strategy:

The Health Facility structural and organizational arrangements that provide opportunities for and operate to facilitate the participation of the pre-school child in the Growth Monitoring Promotion programme.

Rural health unit:

The organization of the health centre, the health sub-centre, the dispensary, the schools and the day care centres to provide or make accessible basic health service in an area occupied by 50,000 people.

ABSTRACT

Through a five year plan of Action Agreement signed between the Ministry of Health of the Government of Kenya and UNICEF, major changes have been introduced into child growth monitoring which has been operating for many years in health facilities around the country. Nine pilot districts are actively involved in the new programme. The major inputs have been: a re-designed child health card; introduction of additional data forms for the newly initiated clinic based nutritional surveillance system and training and supervision of the health facility personnel.

Between January and April 1987, research work was conducted in Vihiga Division of Kakamega District. The purpose of the study was to determine adequacy of Health Centre infrastructure, extent to which the intended growth monitoring services were being delivered as planned and the coverage attained by the Nutritional Surveillannce, Growth Monitoring and Promotion programme. Health Centre programme records were used and a set of questionnaires were administered to the health workers in the programme.

In addition a Community Survey was carried out in order to identify the socio-cultural factors which are potentially associated with the pre-school child's utilization of the growth monitoring services. The research design utilized the WHO recommended cluster sampling methodologies which have already been successfully employed in a number of countries. Data was collected on a total of 300 households with children aged 3-36 months from 30 randomly selected clusters within the division.

The results show that not all the health centres within the division had satisfactory infrastructure. There is need to provide adequate and appropriate supplies of weighing scales, child health cards, and data recording forms. The training of health personnel needs to emphasise the use of growth monitoring as a tool for promoting adequate child growth. Growth velocity is not being emphasised, the approach is still the categorization of normal and underweight children.

The estimated coverage attained for growth monitoring was 32 per cent. This can be increased if all the children making contact with the health centre are weighed, and efforts are made to motivate the community into taking on active part in the programme. Twenty five per cent of the children surveyed had no record of having been growth monitored.

The average age at first weight record was 3 months while the average number of health facility visits was 4. The Household/family characteristics associated with the preschool child's participation in the Nutritional Surveillance and Growth Monitoring and Promotion programme in Vihiga Division inncluded: high child's age at first visit to the health facility, lack of a clinic card and long distance to the health centre.

The results show and support the view that care must be taken when general objectives for growth monitoring, set at national level, are adopted locally. A situation analysis should be made based on information collected on programme implementation and socio-cultural determinants of utilization. Programme objectives and priorities tailored to meet the needs of the local situation can then be made based on this information.

It is hoped that the results of the study will significantly contribute to future evaluations of the Nutritional Surveillance and Growth Monitoring and Promotion Programme in the nine pilot districts.

DEDICATION

This work is dedicated to my husband Linus Ikapel Ettyang and my whole family for their encouragement and support in helping me complete this project.

Your children are not your children.
They are the sons and daughters of
life's longing for itself.
They come through you but not from you.
And though they are with you,
yet they belong not to you.
You may give them your love
but not your thoughts.
For they have their own thoughts.
You may house their bodies
but not their souls.
For their souls dwell in the house of
tomorrow, which you cannot visit
not even in your dreams.
You may strive to be like them but
seek not to make them like you.
For life goes not backward nor
tarries with yesterday.

KAHLIL GIBRAN

UNICEF

CHAPTER 1

INTRODUCTION

In most developing countries, the majority of children in rural areas suffer from growth retardation as a result of the synergism between inadequate nutrition and recurrent infections. Growth monitoring has been identified as one of the ways in which this vicious circle can be broken. The basic strategy relies heavily on the full participation of the mother in the recognition of growth faltering and in the action she can take to correct the situation.

A. STATEMENT OF THE PROBLEM

During the past ten years growth monitoring has been introduced into many programmes throughout the world. Failure in field implementation has been frequent especially when programmes are undertaken at national level. To date results of the few evaluations done show that identification of problems and constraints unique to each local situation will greatly enhance the intended impact of the programmes.

Emphasis is also being put on the need to make clear distinctions between growth monitoring of individual children and population based growth surveillance. In view of this, it is evident that process evaluation of ongoing growth monitoring programmes is paramount. The results of such evaluations will provide planners with information on which to base their judgement on the operational performance of existing programmes. In addition the main administrative and logistic barriers that need to be changed will be identified and this will help increase the consistent use of growth monitoring services by the intended target population.

B. DRAWBACKS IN PROGRAMME IMPLEMENTATION

Taylor emphasises the fact that faltering of child growth is the best single general indicator of an early stage of problems in child health and development. He points out that, Growth Monitoring and Promotion (GMP) is an invaluable tool for assisting the health workers and the parents to identify children with nutrition and health problems early enough so that timely action can be instituted. Growth surveillance on the other hand is concerned with assessment of groups of children in various population units in order to define causal determinants influencing nutritional status (Taylor, C.E.,(1988)).

Unfortunately, the unique potential of growth monitoring has not yet been fully realized. One of the main reasons for this has been the belief that GMP is simple and therefore it must be easy. Contrary to this view, evidence from countries which have implemented GMP programmes shows that providing weighing scales and growth cards is not enough. Both the backing of the health services and the participation of the community and especially the mother are necessary if GMP is to make a positive contribution to the development of the health and nutrition of the pre-school children.

This crucial point has been emphasised by Hendrata and Rohde who state that GMP should find the organizational means that will ensure that "the worker interacts with small groups of mothers, that they find participation attractive, easy and not time consuming and most of all rewarding". These two authors make it clear that "GMP is not simply a nutrition strategy related to feeding a child, but it must address the total scene, the total environmental, and the total situation in which the child is growing". (Hendrata, L., & Rohde, J.E (1988)).

Another possible reason for the widely recognized failure of growth monitoring has been discussed by Rohde in his paper entitled "Promoting Healthy Growth". He maintains that GMP "has not been well understood, not been defined, and in fact not been carried out".

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GMP unlike Immunization and Oral Rehydration Therapy (ORT) is not in itself a biologically effective technology. A two stage process of screening and intervention is needed. A definition of GMP developed at a national meeting in India states that:

> *"Growth Monitoring and Promotion (GMP) can be defined as an operational strategy of enabling mothers to visualize growth or lack of growth and to receive specific, relevant, and practical guidance in ways in which she, her family and the community can act to assure health and continued regular growth in her child. GMP implies a regular and sequential measurement of growth, recognizing it to be the result of overall health, nutrition, environment, social, psychic and development factors in the child..."(Rohde J.E. 1988 Pg. 15).*

There is still little information on the advances made by programmes in the countries of the African region. Thus evidence of the programme's successes or failures are limited. Despite this, in several countries of this region, commitments have already been made to implement GMP as part of the "Child Survival Revolution". National GMP programmes are underway in countries such as Zimbabwe, Swaziland, Kenya, Botswana, Lesotho, Zaire and Tanzania. Evidence shows that for GMP the greatest constraint in moving from successful pilot projects to these large scale national programmes has been a lack of flexibility in

adapting general principles of GMP to specific local conditions and implementing the GMP as a Health facility activity without involving the community. It has been pointed out that while longitudinal situation analysis studies will establish the impact of GMP on health and nutrition, it is important at this point to monitor the more immediate problems likely to occur during implemetation. (Taylor, C.E., (1988), Grant, J., (1985) Yee, V., & Zerfas A., (1987) Lakhani, A.D., (1984)).

C. AREAS OF RESEARCH

Some technical areas requiring research have been documented and they include studies on : how to improve weighing devices; format of growth charts; means of health education and social mobilization. It is also apparent that there is an urgent need for operations research on field procedures, and reporting mechanisms especially where data from GMP programmes is also used for Nutrition Surveillance purposes. (Taylor, C.E., (1988) Hendrata L., & Rohde, J.E., (1988). In addition to these technical issues, some underlying socio-cultural determinats of GMP and nutritional surveillance need to be understood as they apply in particular field conditions. (Hendrata, L., & Rohde, J.E. (1988), Yee, V., Zerfas A. (1987) Lakhani, A.D., et al (1984)).

A recent review of the main Asian proggrammes by Gopalan and Chatterjee focused on the operational problems of collecting reliable growth data under field conditions and on the use of growth information by the health workers to improve the health and nutrition status of children. They noted that weighing and charting is a more difficult technology than was previously envisaged and that health workers have considerable problems in using the technology to produce reliable and accurate results. They also noted that in training, measurement techniques were emphasised rather than the more complex tasks of involving the mother and the community in the whole process of Growth Monitoring. (Gopalan, C., Chatterjee, M., (1985)).

Here in Kenya, a Five Year Plan of Action Agreement signed between the Ministry of Health and UNICEF has facilitated introduction of Child Growth Monitoring services in the Maternal and Child Health and Family Planning (MCH/FP) clinics in nine pilot districts across the country. Inputs have been in the areas of service implementation and delivery. However, there has been a growing concern that problems and constraints unique to each local situation need to be identified if the intended impact of the GMP programme is to be realized.

D. RESEARCH QUESTIONS

As a result of the concerns outlined above, an evaluation was planned and designed with the aim of providing information that could be used for managerial purposes by the following interested parties: Ministry of Health (MOH-Kenya), since it is involved in planning and implementation at the national level; UNICEF, since it is the main sponsoring body; the Kakamega District Implementation Team (DIT) whose members are involved in planning and implementing the programme at district level; the Health Centre Team (HCT) whose members are involved in administrative and day-to-day working activities.

In order to provide this information, a Division in Kakamega district was used to assess the extent of Nutritional Surveillance, Growth Monitoring and Promotion (GM/P) programme implementation as well as identify the household/family characteristics likely to influence the target group's participation in the programme.

Kakamega District was among the first districts to implement the Nutrition Surveillance and GMP programme. By January 1986, out of a total of 47 Health centres, 83% had reported their data to the Headquarters. In February, the District had 97% of Health centres reporting. This was the highest percentage for all the nine pilot districts. By March, an average of 12,000 children had been weighed

per month in the Health centres of the District. The four main research questions are to determine:

1. Whether the infrastructure for GM/P and Nutritional Surveillance was adequate.

2. The extent to which the intended GM/P and Nutritional Surveillance services were being delivered as planned.

3. The extent to which coverage for the target population had been achieved through the health facility based programme.

4. The household/family characteristics which are associated with the potential participation of the target group in the programme.

E. ASSUMPTIONS UNDERLYING THE INVESTIGATIONS

The two main assumptions underlying these research questions are that:

1. Appropriate service areas, equipment, materials, skilled personnel, and implementation of relevant and planned procedures will influence the extent to which the Nutritional Surveillance and

GM/P programme reach its intended target population.

2. The level of the target group's participation in the Nutritional surveillance and GM/P programme is influenced by household/family characteristics.

CHAPTER II

REVIEW OF LITERATURE

A. INTRODUCTION

Growth Monitoring and Promotion (GM/P) is a procedure that requires a child to be weighed regularly, often monthly. This can be done either at the clinic or in the home or at any regular meeting of mothers. These regular monthly weights can be used to assess a child's nutritional status and to make malnutrition visible to the mother if she can understand the symbolism of the growth chart. For the health worker, the Growth Chart represents a valuable opportunity to discuss child health and nutrition with each individual mother. This interaction with and involvement of, the mother is perhaps the greatest contribution the growth chart can make to child development and child health (Hendrata, L., & Rohde J.E., 1988 Grant, J. (1985) Morley R. (1973c) Griffiths M. (1988)).

Since growth charts were first pioneered in West Africa by Morley, growth monitoring charts have been developed and refined in different regions of the world. These charts have proved to be valuable source of standardized information which can provide a data base for nutritional surveillance systems designed to monitor the health and nutrition of preschool children. The current view is that simple analysis of community based growth monitoring data, could serve as a basis for community level nutritional status surveillance. (Taylor, C.E. (1988)).

B. REFERENCE STANDARDS

The anthropometric measurements commonly used to monitor the nutrition status of children include: weight, height, arm circumference, and determination of the child's age. Monitoring the growth of a child requires comparing the same measurement taken at regular intervals. A single measurement only indicates the child's size at the moment; it offers little information about whether the child's size is increasing, entering a period of stability or declining. Most malnourished children will continue to grow at a slower pace unless they are extremely ill. It is easy to mistake some growth for adequate growth. As such a child's data are usually compared with those of a reference population to facilitate evaluation of his nutritional status.

The most frequently used reference standards have been from the U.S.A. the "Harvard Standards', and from the U.K. the "Tanner Standards" . (Start, H.C., & Stevenson, S.S., (1959) Tanner, J., et al (1966)). The World Health Organization recently has recommended use of the National Centre for Health Statistics (NCHS) data since the sample size used was drawn from a more heterogeneous population. (WHO Nut/78.1 (1978),National Centre for Health Statistics June (1976)). The question of which population provides the most relevant reference for groups of undernourished children in developing countries has engendered much debate. However, observation that well-nourished children in developing countries grow in much the same way as their counterparts in the developed world has lent support to the use of a single international growth standard for all. (Alanwick, D., (1980), Graitcher, P.L., & Gentry, E.M. (1981) Stephenson, L.S. et al (1983)).

The underlying assumption is that all children have the same genetic potential especially in the early years of life and their growth is more strongly influenced by environmental factors such as nutrition and frequency of illness than by their genes. (Jelliffe, D. (1966) Nutrition Reviews 24, (1966), Habicht, J., et al (1974), Keller, W., et al (1976) Morley D. & woodland M. (1979b)). Some experts argue that genetic background does make a difference particularly for age specific rates

of growth. (Waterlow, J.C et al (1977) Graham, G. et al (1979). Even now it is being debated whether or not separate stand ards are needed for exclusively breastfed infants. (Whithead, R., & Paul, A., (1981)). Some researchers have also argued that the use of a reference standard derived from a developed country's population or even from well-nourished groups in develo ping countries sets impossibly high standards. (Eusebio J.S., & Nube M., (1981)). It has been proposed that developing countries should evolve their own reference standards in order to be more 'realistic' about potential growth achievement of their child populations. (Seth, V., et al (1979), Golderstein, H., & Tanner, J.M. (1980)).

The disadvantages of this have been pointed out. There is evidence to show that ethnic differences in growth are minimal. The case for the use of a common international reference standard will appear to be strong, though exactly where the dividing lines should be drawn and how active under nutrition ('wasting') may be distinguished from chronic form ('stunting') are matters not yet agreed upon. (Editorial, The lancet, (142) (1984)). In practice, however collection of data to derive local reference standards is a difficult, time-consuming and expensive undertaking. Furthermore, the use of local standards is complicated by the fact that improvement in nutrition in the country will change

the 'standard' itself. Reference populations have been recommended for use with local adaptation or qualifications. (Jelliffe, D., (1966), Waterlow, J.C. et al (1977), Gueri, M., et al (1980)).

C. CLASSIFICATION OF NUTRITIONAL STATUS

A standardized approach for the presentation of nutritional status indicators allows for inter-country comparisons as well as for the evaluation of trends within countries. Reference standards have been used to classify different grades of nutritional status. This is done in two ways: one by calculating percentages of the Median using the Harvard reference values; two by calculating either percentiles or standard deviations of the mean using the NCHS reference values. The first method is the basis of the widely used Gomez Classification of Malnutrition. This classification uses Weight for Age (Wt/Age) values from the Harvard standards. Wt/Age values between 90-75% are indicative of mild Grade 1 while values between 75-60% indicate moderate or Grade II malnutrition, values below 60% of the reference standard indicate severe or Grade III malnitrition. (Gomez F., et al (1956)). Some variations of this classification have been suggested by other investigators. Griffiths M., (1988), Bengoa, J., (1970), Shah, P. et al (1976)).

To indicate children who have a low Height (or recumbent length) for their age, the term 'stunting' has been adopted, and classifies children whose skeletal development has been slowed. Stunting is sometimes associated with poor overall social and economic conditions as it manifests as a result of continued or repeated episodes of inadequate food supply and/or infection (Kanawati, A., & Mclaren A., (1970),WHO Technical Report No. 593 (1976)).

A combination of Weight and Height measurements has also been suggested so as to distinguish between children who are skinny and emaciated from those who are short. The term "wasting" has been employed to express condition of an individual who has a low weight for height and has depleted muscle mass and adiprosity. This is usually brought on by immediate acute food shortage and/or increased rate of infections particularly gastroenteritis. (Seoane, N., & Latham, M.C., (1971), Mclaren D., & Read, W. (1972)).

Waterlow also proposed a classification system using Wt/Ht, and Ht/Age. This allows one to distinguish between children who have suffered malnutrition in the past from those who are currently experiencing malnutrition. When malnutrition has been chronic the child is 'stunted' and both his Wt/Age and Ht/Age are low but his Wt/Ht may be normal. In acute malnutrition, however, his Ht/Age is approp-

riate, but he is wasted or of low weight for both height and age. Thus Wt/Ht distinguishes between current malnutrition and long-term chronic malnutrition. (Waterlow, J.C., (1972)).

WHO has recommended the use of the cut off point below -2 standard deviations from the NCHS reference median. Tables have been published with values corresponding to standard deviations from the NCHS reference median for each of the anthropometric measurements. (WHO Nut/78.1 (1978) National Centre for Health Statistics (1976)). In addition, appropriate user friendly microcomputer programmes have been developed which calculate the exact standard deviation score from basic anthropometric measurements of age, sex, weight and height. (Jordan M.D., (1986)).

Evidence from several studies shows that arm circumference measurements can be used when ever age, weight and height data are not available. (Sharkir, A., & Morley, D.D., (1974) Zerfas, A., (1975), Trowbridge, F., & Stachling, N. (1980) Chen, L.C. et al (1980) Kasongo Project Team (1983)). Quite a number of reseachers point out that Wt/Age as a nutrition indicator is not sensitive to a stunted child who is growing well, or to the very tall child who may be malnourished. (Chen, L. C., et al (1980) Anderson, M. (1979) Zeitlin M.F. (1986). The measurement relies on Age data which are often subject to error. Age data for children below two years old have been found accurate or if in error, easily

corrected, but it is difficult to accurately estimate unknown ages for children over two years. (Lozy, M., (1970)). Though age data is a valid indicator through the pre-school years, it is better if used with children aged 0-2 years because height retardation is less pronounced. (Waterlow, J.C., et al (1977)).

D. GROWTH MONITORING

Besides describing the nutritional status of a population, growth data are being used to identify and monitor children with growth retardation. Children are usually 'graded' according to the degree of their growth retardation observed at a given point of time. Their progress to higher levels of nutrition is then monitored. This is because studies have shown that severely malnourished children as measured by any indicator have a much higher risk of mortality than well nourished children (Gomez F. Et al (1956) Scrimshaw, N. S., et al 1968) Puffer R.R. et al (1971)). Wt/Age was first used in Narangwal to assess and quantify the mortality risk carried by a given degree of malnutrition. (Kielmann, A.A., & Mc Cord, C., (1978)). Subsequent studies done in India and Zaire have borne out this relationship between mortality and severe malnutrition based on Wt/Age measurements. (Chen L.C. et al (1980), Kasongo Project Team 1983. Additional evidence has shown that arm

circumference measurements can also be used especially where weight is not available as a predictor of mortality in pre-school age children (Trowbridge, F. Stachling N. (1980) Chen L.C. et al 1980. Vaquera, M et al, (1983)).

The idea that monitoring the growth of the individual child on a long-term basis would be useful in the provision of not only child health care but identification of the "at risk" child gave rise to The Road to Health card pioneered and documented by Morley as a result of long-term study of child growth in Imesi, Nigeria (Morley D., (1973b) Nutrition Reviews 26 (1968)). In the early childhood years growth is rapid and any deviation from 'normal' can be detected easily. The longitudinal weight record is thus intended for early detection of malnutrition. As already pointed out, while a single weight measurement indicates a child's status at a given point in time, serial measurements can differentiate a steady state, an up-swing or a decline in weight and consequently in nutritional status.

Unless the measurements are regularly recorded from an early age, detection of either a steady state or decline in weight will not be easy or possible. The child might be seen when already severely malnourished and corrective measures may not work. As such it is important for the programme to have a well defined target population and to use approp-

riate growth charts and weighing scales. This is particularly essential for a GMP programme where acceptance and participation are usually voluntary and the growth measurements need to be taken at regular and frequent intervals (Cowan B. 1988, Burns, J.O., et al (1988), Burns J.O. & Rohde, J.E., (1988)).

A review of the literature in this area indicates that most clinic/centre based growth monitoring programmes concentrate on children coming to the clinic/centre. Unless the health facility network is well developed, this not only excludes several categories of children in need of growth monitoring but also lowers the potential coverage of the target group. Who is eventually weighed in these clinic/centre based programmes depends on a number of factors related to distance to the weighing post, difficult terrain, motivation of the mother, the services provided, implementation strategies, and most important demands on the mothers' time (Gopalan, C., & Chatterjee, M., (1985) Shah, P., et al (1976), Morley, D., & Woodland, M., (1979a).

The time taken to weigh large numbers of children means that some mothers might have to wait for two to three hours before their children are weighed. Younger children aged zero to three may be at a particular disadvantage since they have to be brought to the centre by the mother or an older sibling. Recent studies in India and elsewhere have pointed out that nutritional problems start within the

first six months of life when growth is rapid. Regular growth monitoring of the pre-school child would be most useful during this period of time. (Kielman, A.A., & McCord, C., (1978), Das, D. et al (1982), Waterlow, J.C., et al (1980), WHO Geneva 36 (1978)).

A major question arising from these observations relates to the specification of the target group. Who should be growth monitored? Growth Charts were developed for use in under-fives clinics and so included the first five years. The WHO modification added the sixth year. Emphasis has been placed on weighing all children under five or six years of age respectively. However, a growing group of professionals feels that it is adequate to weigh children up to the age of three years. This would halve the work load of weighing on workers, reduce crowding at centres and allow concentration on zero to threes who are most at risk of malnutrition. (Gopalan, C., & Chatterjee, M., (1985), Chaudhuri, S.N., (1988).

It is argued that older children could be weighed less frequently since after two years of age the expected monthly weight gain of a child is less than 150 gm which is close to the limits of accuracy of the weight measurements. Also this may be within the intra-individual variation. The table presented in Appendix A shows a detailed breakdown of the expected weight gains for each age group using

the NCHS standards. However, a high prevalence of malnutrition and illness may be observed among three to six year olds in certain situations and the decision to monitor these children by periodic weighing may be taken in accordance with the local situation (Tandon, B.N. (1985)).

E. NUTRITIONAL SURVEILLANCE

Evidence shows that besides the assessment of nutritional status, there are many other variables which should be considered when evaluating the nutrition situation of individuals and populations. The Table in Appendix B shows the clear distinctions that should be made between individual growth monitoring and child growth as a nutrition surveillance indicator. It is recommended that multisectoral systems of Food and Nutrition should be adopted and incorporate such variables as morbidity, dietary intake, agriculture, education and environmental hygiene among others. Interpretation of nutritional status data becomes more meaningful as it allows for associations to be drawn and provides important information for planning and targeting nutrition programmes (Taylor, C.E. (1988), Hendrata, L., & Rohde, J.E., (1988), Mason, J.B., et al (1984), Rohde, J., (1984)).

It has been emphasised that the mere measurement of nutritional status alone only presents information on what has already occurred without addressing the factors influencing it. When growth monitoring data is routinely collected at the health centre for nutrition surveillance purpose, it is important to keep in mind that only those children who are brought to the centre are going to be weighed. One of the problems encountered in trying to quantify coverage in such a situation is almost always the inability to specify the number in need or the magnitude of the target population. As such, though information from programme records is crucial, it is important to note that the quality of decisions made from it will be closely related to its accuracy and reliability, as well as to the degree to which the health facility attenders are representative of the larger population (Gopalan, C., & Chatterjee (1985) Tandon B.N. (1985) Tanahashi, T., (1973), Serdule., M.K., et al (1987)). Though all programmes should keep records on targets served, programme staff must receive adequate training in the skills and terms associated with the care and use of these records. The record system must be simple, comprehensive, appropriate, reliable and up to-date to ensure that fairly accurate estimates of programme coverage can be made (WHO Technical Report series No. 472 (1971), WHO Health for all series No 2-6 (1981).

A GM/P programmes that incorporates Nutritional Surveillance, and is targeted to the entire community but is health facility based, requires perodic quick cross-sectional community surveys inorder to identify and compare those individuals who participate in the programme with those who drop out, as well as those who are eligible but do not participate at all. The drop out rate from such a programme may be an indicator of community dissatisfaction with interventions provided. (Tanahashi, T., (1973) Serdule, M.K., et al (1987), Peter, H.R., & Howard, E.F. (1985)). Such information can be used by project planners and managers to identify how the programme may be modified to attract and retain a larger proportion of the target population. Further, the information is highly useful in judging the worth of a project for continuation and expansion in either the same community or other locations. (Taylor, C.E. (1988), Gopalan, C., Chatterjee, M. (1985), Mason J.B. et al 1984).

F. PROGRAMME IMPLEMENTATION REQUIREMENTS

Most Child Growth Monitoring programmes are an integral part of more comprehensive Maternal and Child Health and Family Planning services (MCH/FP). Their organization and operation in different settings have been described by a number of investigators. Where Nutritional Surveillance and GMP Programme

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services are provided through the MCH/FP services, weighing children and plotting their weights on a growth card is one of the major activities (Williams C. D., (1955). WHO Tech. Rep. Ser. No. 428 (62) (1969), Stan field, J.P. (1970), Morley D., (1973a), Korte, R., Patel P.M. (1974), Cole-King, S.M., (1975)).

Morley for the first time in 1963 evaluated an under fives clinic in Nigeria and gave a detailed description of its operational characteristics. (Morley, D., 1963). Other similar evaluative studies have also been done elsewhere (Cunningham, N., (1978) Galbraith, R., (1976)). Growth Charts are a crucial diagnostic tool in GMP programmes but relatively few evaluations have been published on how the growth chart which the mother keeps at home functions in various settings of the MCH/FP Service Delivery Systems. (Lakhani, A.D. et al (1984), Gopalan, C., Chatterjee, M., (1985), Morley, D. (1973d),Senanayake P., (1977) Tremlett G. et al (1983),. Wit, J.M. et al (1984)).

The first component of any service delivery system includes the structural and organizational arrangements that provide opportunities for, and operate to facilitate the target population's participation in the programme. It is important that the necessary structures in strategic locations, equipment, and materials are made available. Recruitment and follow-up procedures of the specified target

population should be clearly outlined. A referral system as well as an outreach programme should be implemented. (Morley D., (1973a) Peter, H.R, & Howard, E.F, (1985), Aday, L.A., & Anderson, R., (1975)).

A second important area relates to the extent to which the intended services are actually being provided. In this case, the procedures and services provided must conform with the way the programme was designed. The qualifications and competencies of the staff must meet programme implementation needs (Lakhani, A.D., et al, (1984), Peter, H.R., & Howard, E.F., (1985) Maraa, G.,(1985), Abramson, J.H., (1984)).

The early growth monitoring programmes of Imesi, Nigeria (Morley, D., (1963)). Narangwal, India (Kielmann, A.A., McCord, C.,(1978)). and Hanover, Jamaica (Alderman, M., et al (1978)). demonstrated the benefits of growth monitoring as part of health and nutrition programmes. The aim of these programmes was to follow the progress of individual children and to target appropriate curative and preventive interventions based on the diagnosis made. Experience available from subsequent programmes shows that growth monitoring without the back-up of health services and educational follow-up can achieve very little (Hendrata, L. Rohde, J.E., (1988), Griffiths, M., (1988)).

Recent studies suggest that growth monitoring should be conducted as one of the many primary health care interventions along side Oral Rehydration Therapy (ORT), Breastfeeding, and Immunization (Cowan, B.,(1988)). These form the acronym GOBI. Though they are the four principal Child Survival Revolution Interventions (CSRI) being advocated by UNICEF, both the complexity and benefits of growth monitoring should be placed in perspective, especially when programmes are planned at national level. Of the components of the GOBI package, Growth Monitoring is the most difficult to implement well because of organizational, technological, and training problems. This is borne out by the fact that although many programmes use growth cards, there are few countries with national growth monitoring efforts especially in the African region. (Hendrata, L., & Rohde J.E. (1988) Grant, J. (1985) Gopalan, C., & Chatterjee M. (1985)).

The resources required for a good growth monitoring programme have often been unde estimated. Although the cost of growth mon toring remains extremely low in comparison that of other child survival activities, it now evident that much more must be done th simply supplying workers with growth char The health workers themselves require appr riate training, in: the use of the Growth Monitoring tools, the interpretation of results and the selection of feasible interventions (Korte, R, Patel, P.M., (1974) Maraa G. 1985, UNICEF social and statistic Programme occ. paper No. 4 T988 (1983)).

Rohde and several other investigators such as Taylor and Hendrata point out that the design of some growth monitoring programmes puts emphasis on the child's nutritional status rather than the growth trends. In most of the programmes, a mother's participation is usually passive, the groups tend to be large, stress is put on older children who could already be malnourished, there is very minimal education focus and referral or backup opportunities for children in trouble are unvailable. (Taylor, C.E., (1988), Hendrata, L., & Rohde, J.E., (1988) Rohde, J., (1984)).

In conclusion, it is evident that GMP has the potential for assisting in early diagnosis of growth faltering so that timely action can be instituted. Prevention of growth failure is therefore the basis of growth monitoring. For this to be effective, a GMP programme needs to be linked to a system that has organizational means to ensure that workers' and mothers' participation in the programme is rewarding. The target population itself and the techniques used to identify it need to be appropriate. The degree of growth faltering in the target population and the specific periods of vulnerability need to be clearly stated. The socio-cultural factors likely to influence growth monitoring and specific to local situations need to be known. In programme implementation, clear distinctions need to be made between growth monitoring and use of growth monitoring data for Nutritional Surveillance purposes.

CHAPTER III

RESEARCH OBJECTIVES

The Nutritional Surveillance and Growth Monitoring and Promotion (GMP) programme is being implemented in all the government health centres within Vihiga Division of Kakamega District. The overall aim of this investigation was to identify weaknesses and constraints affecting the quality and quantity of services being provided. The evaluation findings will be used to formulate a series of recommendations which will focus on improving the programme in Vihiga Division. It is also hoped that the methods used can provide a basis for future evaluations of the programme. The objectives of this investigation were stated as follows:

A. To determine the quality of the services being delivered by the clinic based Nutritional Surveillance and Growth Monitoring and Promotion programme in the Health centres.

1. To determine availability of infrastructure in terms of provision of: skilled personnel; service areas; appropriate and relevant equipment and materials.

2. Assess the growth monitoring process in terms of the health workers' ability to carry out correct and appropriate procedures.

B. To estimate the coverage which has been attained for growth monitoring through the health centre based Nutritional Surveillance and Growth Monitoring and Promotion programme.

C. Identify the Household/family characteristics associated with the pre- school child's participation in the Nutritional Surveillance and Growth Monitoring and Promotion programme.

CHAPTER IV

STUDY DESIGN AND METHODS

The study was conducted in Vihiga Division of Kakamega District. It was designed to evaluate the Nutritional Surveillance and Growth Monitoring and Promotion (GMP) programme being implemented in the Division. To improve the health and nutrition of the pre-school child population, the programme has focused its energy and resources on the use of the growth chart to monitor the pattern of growth of each individual child. Emphasis has been put on the action the health workers should take when early signs of growth faltering are identified.

A. INDICATORS

The specific indicators used in the evaluation were identified using information from the programme training manuals. The tools of measurement developed incorporated all the identified indicators. In addition a community cross-sectional descriptive survey was carried out to identify factors likely to influence the pre-school child's

participation in the programme. The conceptual framework for the study design is presented in Appendix C. A further break down of the main indicators used are shown in Appendix D.

B. TOOLS OF MEASUREMENT

Direct observation was used to get information on the available Health Facility infrastructure for growth monitoring. An essential part of this approach was to plan for the systematic recording of observations made. This required data guides that could be filled in by the investigator from her observations. Using this approach the tools of measurement presented in Appendix E were used to collect information on : availability and condition of service areas for growth monitoring as well as provision of appropriate equipment and relevant educational materials.

The same approach was also used to collect information on: organization of patient lines of flow, appropriateness of registration procedures, health cadres skills in weighing, accuracy of the weight measurements and the means used to provide nutrition counseling. The tools of measurement are presented in Appendix F.

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Child Health and Nutritional Information system (CHANIS) has been implemented in order to provide, on an ongoing basis, information for decision making. The health centre's CHANIS records were examined in order to obtain information on: use, maintenance and completeness of the records and the number of children weighed per month. Information was also obtained on out-reach activities, follow-up and referral systems Appendix G presents the tools of measurement used to record information from the Health centre records.

To collect information on personnel deployed in growth monitoring, the most efficient approach was found to be the use of a structured questionnaire. This was used to collect information on: availability of trained personnel and their knowledge on uses of growth monitoring information. Appendix H presents the tools of measurement used.

During the community survey, a structured questionnaire was used to collect information on Household/Family characteristics likely to influence the child's participation in the programme. Appendix I presents the tools of measurement used.

C. PILOTING

Before the measuring tools were finalized, extensive piloting was done in Machakosi District Hospital and Athi River Health Centre. Standardization of the measuring instruments was finally done after further piloting was carried out in Hamisi Division of Kakamega District.

D. SAMPLING

All the four government health centres implementing Nutritional Surveillance and t he GM/P programme were investigated. Only the health personnel involved in the day to day running of the programme were sampled. A cross-sectional Community Survey was carried out inorder to identify factors that affect the pre-school child's participation in the programme.The sampling techniques explained by Cochran were used to randomly choose households within the Division (Cochran, W.C.,(1963)). The programme partici pation of the child was treated as a binomial variable. Individual children were classified as belonging to one of two categories.

The size of the random sample required for this survey was determined using the formula indicated below :

$$n = \frac{z^2(pq)}{d^2}$$

where :

n = number of persons required in the sample.

d = the precision of the result desired. For growth monitoring an estimate that lay within ± 10% from the population mean was considered adequate and 'd' was assigned a value of 0.10.

z = the confidence limits of the survey result. For growth monitoring a confidence limits of 95% was considered adequate. This means that a range of ± 10% from the sample result should include the true result in 95 of every 100 surveys performed. The value of 'z' 1.96 for confidence limits of 95% was used.

p and q = The 'p' is the proportion of pre-school children who do not participate in the programme and 'q' is the proportion of pre-school children who participate. The addition of 'p' and 'q' must equal to 1.0. As the value of 'n' in the formula is maximised when 0.5 is assigned to both 'p' and 'q'. This was the value adopted. Solving the formula :

$$n = z^2(pq)/d^2 = (1.96)^2\ (0.5)(0.5)/0.1^2$$
$$= (3.84)\ (0.25)/0.25)/0.01 = 96$$

If the 96 people live in a sparsely populated area and if they are to be chosen randomly, it would take a lot of time to identify and collect information from them. To overcome this problem, Henderson advocates use of 30 randomly selected clusters with a minimum of 7 households in each cluster. (Henderson, R.H., Sundaresan, T., 1982).

A further design effect correction factor of 3 was added. Solving the formula:

$$n = z^2(pq)x3/d^2 = (1.96)^2\ (0.5)\ (0.5)(3)/0.1^2$$
$$n = (3.84)\ (0.25)\ (3)/0.01 = 288.$$

In order to select the 288 households the cluster sampling procedure described by Henderson were used. Taken into account also were the modifications to this method suggested by Kok as a result of experience he and his collegues gained through application of this method in Machakosi District, Kenya. (Henderson,R.H., & Sundaresan T., 1982; Kok, P.W., & Kwamanga, D.A., (1982) Kok, P.W., (1986)

Kok suggests use of Primary Schools were enrollments is above 70% . Vihiga Division has a total of 70 Primary schools with a standard one enrollment of 82%. In order to locate each study cluster, 30 primary schools were randomly selected. Identifying the starting point for each cluster involved visiting each of the already randomly selected primary schools. The purpose of the visit to the s chool was explained to the headmaster.

The standard one pupils were made available to the investigators. One from all the standard one pupils was randomly choosen and she/he directed the investigation team to her/his home. The household from which this child came from was identified and it became the target household for the study cluster. To minimize bias in sampling, the target household was not included in the sample but 10 nearests households were selected. The total sample size was 300 households randomly choosen from 30 clusters with 10 households each. The sites of the clusters are shown in the map of Vihiga Division Appendix J.

E. HEALTH CENTRE RESEARCH ACTIVITIES

1. Assessing health cadre's skill in weighing

The health cadre's skill in weighing was assessed using a scoring system developed on a 0-10 scale. Each health worker was expected to receive a score of 0 or 1 in each of the 10 categories shown in Appendix K.1. To obtain a 50 point score, each health worker was required to weigh five randonly selected children. This information was obtained on only the health personnel carrying out the weighing procedures in the four health facilities. Classification of the scores was as follows: 0-10 very poor, 11-20 poor, 21-30 fair, 31-40 good, and 41-50 very good.

2. Assessing accuracy and precision of the weighing scales

To determine the accuracy of the weight measurements, a bag of beans weighing 1,335 gms was used. A measurement within the range of ± 100 gms was regarded as an acceptable level of accuracy. To determine the precision of the scale the bag of beans was weighed three consecutive times. The level of precision was acceptable if the three

weight readings were consistent. To assess the health cadre's ability to weigh accurately and precisely, they were asked to weigh the bag of beans and their weights compared with the investigator's. To further check the accuracy and plotting of the weights on the child health card, 10 children were randomly chosen for each health facility. The weights plotted on the card were compared to the weight of the child obtained by the investigator. Acceptable limits were ± 100 gms.

3. **Assessing health cadre's competence in nutrition counseling**

Scores to assess the health personnel's competence in nutrition counseling were also developed on a 0-10 scale. Each health worker should have received a score of 0-1 in each of the categories shown in a Appendix K.2. For each measure, the lowest score, zero, means the procedure was not correctly done. The highest score, one, indicates that the procedure was correctly done. To obtain a 50 point score each health worker was required to give nutrition counseling to five randomly chosen clients. Classification of the scores was as follows: 0-10 very poor, 11-20 poor, 21-30 fair, 31-40 good and 41-50 very good. This classification is based on the procedures which are outlined in the programme training manuals. A break down of

the main areas considered is shown in App. K In general the health cadre got a poor score where her counselling was hapharzard and where most of the outlined steps were ignored. A good score was obtained if the counselling was systematic and followed the sugguested outline.

4. Assessment of health cadre's knowledge on use of growth monitoring information

The health cadre's knowledge on use of growth monitoring information was assessed using a score developed on a 0-50 scale. For each measure, the lowest score, zero, means wrong answer or no comment, three means a satisfactory answer and five means a correct answer. To obtain a 50 point score, each health worker was required to give answers to the categories shown in Appendix K.3. Classification of the scores was as follows: 0-10 very poor, 11-20 poor, 21-30 fair, 31-40 good, and 41-50 very good.

F. COMMUNITY SURVEY

To locate the starting point for each study cluster, the procedures outlined by Kok were used (Kok, P.W., & Kwamanga, D.A., (1986)). A target household was identified through randomly chosen primary schools. The procedure involved using a randomly choosen

standard one pupil who directed the investigation team to his/her home. This home became the target household and the starting point within the cluster. Ten households excluding the target household were investigated.

The tools of measurement used covered a range of relevant health and social indicators. The pre-school child's age was calculated in the field and was checked using replies to the age related questions. All the available clinic and treatment documents were scrutinized to determine the immunization history and the number of times the child had visited the health facility and was weighed.

In addition for descriptive purposes information on morbidity was also collected. The investigator used her own observations to get some of the information relating to household social amenities. A special questionnaire dealt specifically with the mother's socio-economic background. Emphasis was put on determining her level of satisfaction with what was identified as the nearest health centre. Her ability to interpret the growth pattern was assessed by using different growth trends boldly drawn on a child health card. Appendix L illustrates the growth trends used.

Physical access to the nearest health facility was estimated in three different ways. The first procedure involved noting down the exact number of kilometres to each cluster from the nearest health facility. This was done using a research vehicle. The second procedure involved asking the mother to say the length of time it takes her to reach the health facility. The third procedure was done after the 30 clusters were completed. Four of the health personnel helping in the investigation were instructed to time their walk from 10 randomly selected clusters.. Their time was then compared to the time given by the mothers. The difference was not significant.

G. EQUIPMENT USED AND MEASUREMENTS MADE

Information on the child's age, weight and length, were collected to allow for the computation of three nutritional status indices, height-for-age, weight-for-age and weight-for-height. The equipment used to measure the children consisted of:

1) A spring dial scale calibrated from 0-25 Kgms in 100 gm sub-divisions.

2) A pair of plastic pants with a harness for supporting the children during weighing.

3) A stadiometer or length board which consisted of a rigid board about 120 cm long with a head-rest which was rigidly fixed at right angles to the base of the board when in use. A centimetre tape measure was attached to the side of the board.

Length was determined by placing the child lying on its back on the stadiometer with the foot rest placed firmly against the child's feet so that they were perpendicular to the base board. The child's length was then read from the tape measure to the nearest centimetre.

Before weighing, the mother was asked to remove the child's shoes and clothing. The child was placed in the pants which were then suspended from the hook of the weighing scale. The scale was hung on a rope tied to a convenient place and the weight was read to the nearest tenth of a kilogram.

H. TRAINING OF ASSISTANTS

There was one permanent research assistant who helped in the survey work throughout and three health personnel from each health centre. The main role of the three health workers was to identify the study clusters near their health centres. The permanent assistant was trained for a period

of two days. The health workers were trained before visiting the community for a period of 1 day once investigations in their respective health centres were completed.

I. DATA PROCESSING, VALIDATION AND ANALYSIS

All field operations were supervised by the investigator. Continuous checks were made on the accuracy with which the measurements were recorded. Interviews with the mothers were witnessed from the beginning to the end. Manual editing of the questionnaires was done every evening. This involved checking that :

1. The identification, sub-location names, cluster and household numbers were correctly filled in.

2. Response codes were valid.

3. Weights and heights were within permissible range.

The data from the checked questionnaires were entered onto a diskette using an IBM micro-computer. Prior to the data analysis a number of programmes were used to validate the data and to create files in readiness for the analysis. The survey data was anal-

ysed on an IBM micro-computer. The software used in data analysis were SPSS, (William, R.K., et al (1975)). ARIEL (ARIEL Information Management system (1986)), and CDC Athropometric statistical package (Jordan, M.D., (1986)).

The study design basic to this investigation was to estimate the proportion (probability) of households having growth monitored children. The Growth Monitoring frequency already adopted in Swaziland was used (Chaudhuri, S.N., (1988)). Growth monitoring levels were assigned according to quartile ranks as determined by the child's age and the number of times the child had been weighed.

The household/family characteristics associated with the probability of a child having at least three weight records were identified using Automatic Interaction Detection (AID) in conjunction with Multiple Classification Analysis (MCA) (Morgen, F.M., et al (1967)). These are procedures which are incorporated in the ARIEL information management system.(ARIEL, (1984)).

J. LIMITATIONS OF THE DATA

There are two possible limitations to the data collected in this survey. Sampling error in terms of sample size and sample bias. Non-sampling errors that could

include : seasonal variation, uneven coverage, errors in reported age, inaccurate reading of measuring equipment, non-responses, and non availability of complete clinic documents.

CHAPTER V

STUDY SETTING

A. INTRODUCTION

Kakamega District is one of the three districts that constitute Western Province. Vihiga is one of the ten administrative divisions of the district. This division is further divided into three locations namely West, South and North Maragoli. The three locations have a total of 28 sub-locations.

1. Climate

Temperature varies between a mean maximum of 26° - 32°C and a mean minimum of 14° - 18°C. Rainfall varies from 1,250 mm to 2,000 mm annually. It is reliable and adequately distributed. Rainfall is highest between March and October and least in April/May and August/September.

2. Topography

The whole of Kakamega District forms part of Lake Victoria basin. Altitude falls from about 1,500 m above sea level in the East to about 1,250 m in the West. Typical soils in the district have a moderate chemical composition suitable for plant production.

3, Land Use

Ecologically Kakamega lies within the star grass zone. This zone has a high agricultural potential lying below 1,800 m above sea level and very suitable for maize, coffee, and exotic cattle. Ninety per cent of the land is arable and no land has been put under irrigation.

B. THE NUTRITION SURVEILLANCE AND GROWTH MONITORING AND PROMOTION PROGRAMME

Rural Health services form the basis of the community and family health services. To enhance its, implementation, the Ministry of Health has an Integrated Rural Health/ Family Planning Project which constitutes 21% of the entire development and recurrent

health services funding. Its catchment can be the Division or a Rural Health Unit. The District Health Management Team (DHMT) forms the Ministry of Health's implementation team in the government policy of the District Focus for Rural Development. The DHMT has been instrumental in the implementation of the Nutrition Surveillance and Growth Monitoring and Promotion (GMP) programme.

The two main programme objectives are:

. "To improve the nutritional status of pre-school children through closer attention to growth patterns".

. "To produce information on the nutritional status of children which will be useful for making local, district, and national decisions relevant to nutritional needs of the country".

The Nutritional Surveillance and GMP programme has three broad components :

1. <u>Preventive component</u>

Energy and resources are focused on :
"use of the Growth Chart to monitor the pattern of growth of each individual child and the intervention/nutrition messages that the health worker should use when early signs of growth faltering are identified.

2. Training component

The teaching materials and the training programme are directed toward helping health workers deal with the individual child and the community.

3. An informative component

An information system was developed to provide data for health workers at all levels. The data set will be used for monitoring and evaluation purposes. It will also provide information on the performance and output of the programme.

The implementation strategy, training materials, and data record forms were developed in May and June, 1985. Improvement suggestions on the training materials and data forms were obtained from district nutritionists who attended two workshops held in July and August, 1985. Nine pilot districts were chosen and included : Baringo, Embu, Kakamega, Kitui, Kwale, Machakos, Murang'a, Nakuru and Siaya. An implementation team was formed for each of these districts. Members of the team were supposed to include the District Medical Officer of Health, the District Nutritionist, the District Public Health Nurse, the District Clinical Officer and the District Information Officer.

To introduce the programme at the health facilities within their respective districts the implementation teams from each District developed the budgets shown in Appendix M.

Implementation of the programme involved : One, the sub-district training of the personnel within the different health facilities. Two, follow-up visits to determine extent of health facility programme implementation. The individual health facility implementation schedule was divided into five stages. A detailed description is provided in Appendix N.

C. RESEARCH INFRASTRUCTURE

To evaluate the Nutrition surveillance and GM/P programme, research investigation was done at the four Government Health Facilities (HF) providing growth monitoring services in Vihiga Division. These were Sabatia Health Centre (HC), Mbale Rural Health Training Centre (RHTC), Vihiga Health Centre (HC) and Lianaginga Sub-health centre (SHC). Their location in the division is shown on the study area map in Appendix J. Sabatia and Vihiga have been in operation for over forty years while Lianaginga is 22 years old and Mbale, which is relatively new, is only 9 years old.

All the health facilities with the exception of Lianaginga are less than 5 minutes walk from a tarmac road or a school and or

an administrative post. The main health services available are Maternal and Child Health and Family Planning (MCH/FP) as well as curative services. Appendix O shows the diagrammatic presentation of the different lines of patient flow operating in the four health centres to facilitate delivery of growth monitoring services to the pre-school child.

During the 1979 census, the population of Kakamega District was 1,030,887 people of which 7.6% (78,645) were aged 0-1 and 19.5% (201,320) were aged 0-4 years. On average, it has been estimated that 19% of the population in Africa is aged 0-4 years and approximately 4.5% under one year (UNICEF, (1983). Table 5.1 shows the estimated 1987 total population in each of the catchment area of the health facilities within Vihiga Division. Children aged 0-1 years comprised 4.5 per cent (8,692) of the total population and children aged 0-5 years comprised 23% (36,693) of the total population.

TABLE 5.1

SIZE OF CATCHMENT AREA AND ESTIMATED POPULATION FOR THE HEALTH FACILITIES IN VIHIGA DIVISION : KENYA

Health facility	Total land sq km	Estimated 1987 pop.	Children Aged 0-1	Children Aged 0-5
Sabatia	51	52362	2357	9949
Vihiga	46	46098	2075	8759
Mbale	65	78317	3524	14880
Lianaginga	75	16342	736	3105
Total	237	193119	8692	36693

D. CHARACTERISTICS OF THE STUDY POPULATION

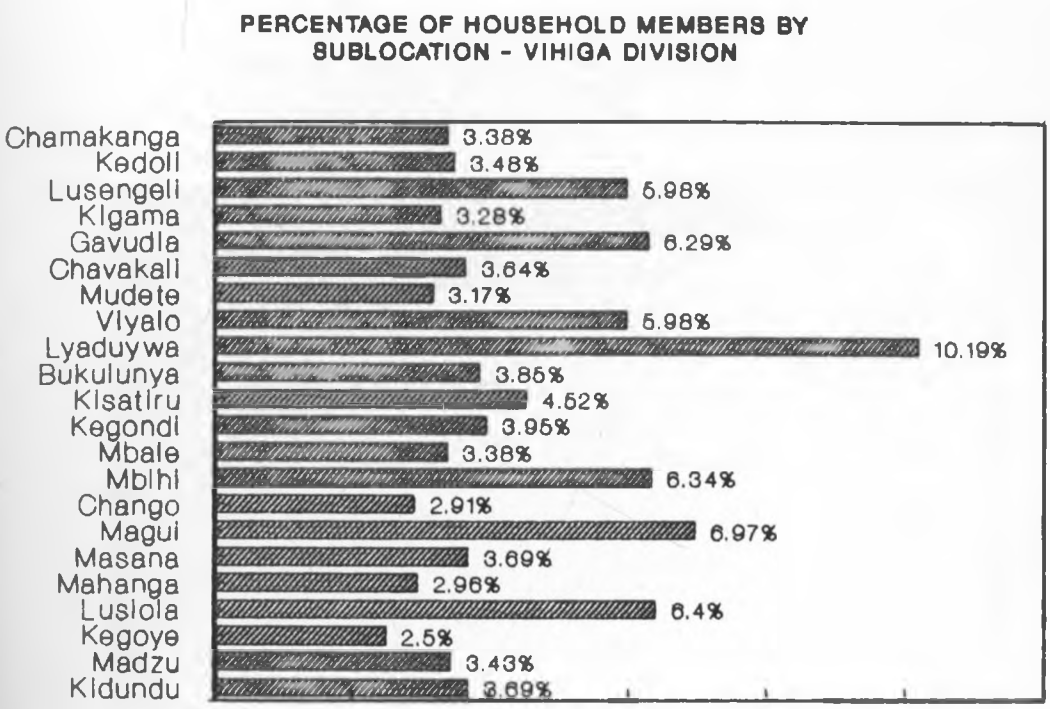
1. Household members

Vihiga Division has three administrative locations. The community survey was carried out in all the three locations. A total sample of 300 households was included in the survey. The following are the households surveyed in each location, North Maragoli 70, South Maragoli 120, and West Maragoli 110.

As can be seen from the map in Appendix J, administratively Sabatia HC serves the North and West Maragoli locations. Vihiga HC mainly serves South Maragoli location, Mbale RHTC serves both South and West Maragoli locations and Lianaginga serves South Maragoli location.

The division has 28 sub-locations. The community survey was carried out in 22 sub-locations of the division. The 300 households had a total of 1,923 household members. Figure V.1 shows the per cent distribution of the household members in the 22 sublocations. Lyaduywa sub-location contributed the highest percentage (10.2%) of household members surveyed. Kegoye sub-location contributed the lowest percentage (2.5%) of household members.

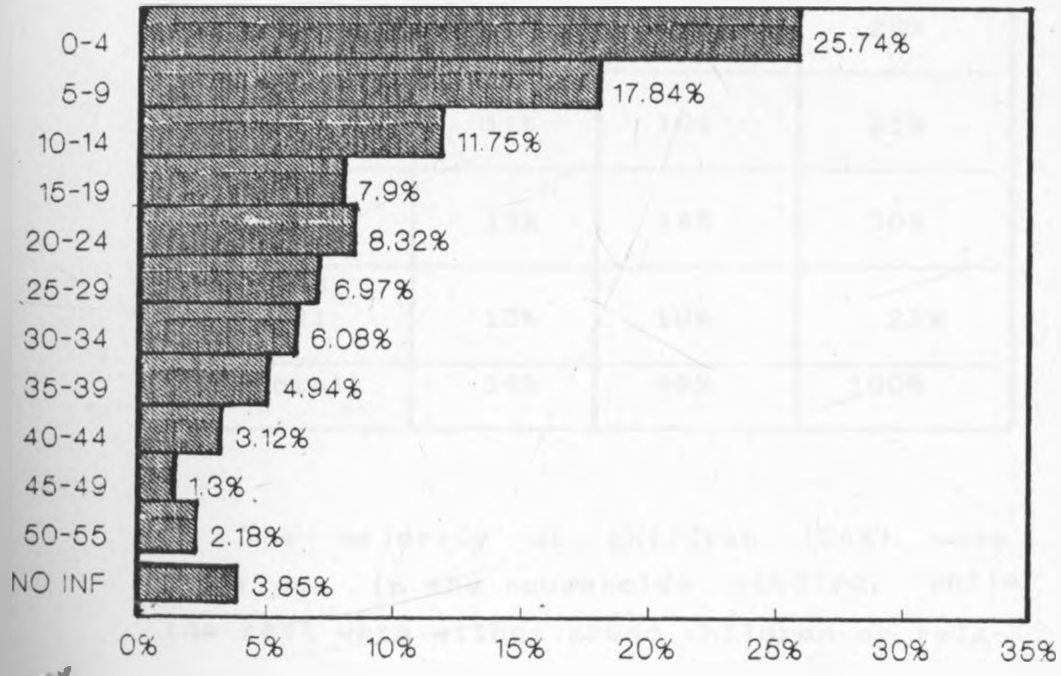
FIGURE V.1



The majority of the households (98%) were male headed. Household size ranged from 2 to 15 people with an average of 6 persons per household. Figure V.2 shows the distribution of the different age groups. The majority were children aged 0-4 years. A small number of household members (4%) had no age information available.

FIGURE V.2

PERCENT DISTRIBUTION OF HOUSEHOLD MEMBERS BY AGE GROUP: VIHIGA DIVISION - KENYA



The 300 households in the study sample, had 358 children aged 3-36 months, of which 300 were randomly selected Table 5.2 shows the age and sex distribution of the children. Of the 300 selected, 155 were Male and 145 were Female The majority of the children were above 16 months of age.

TABLE 5.2

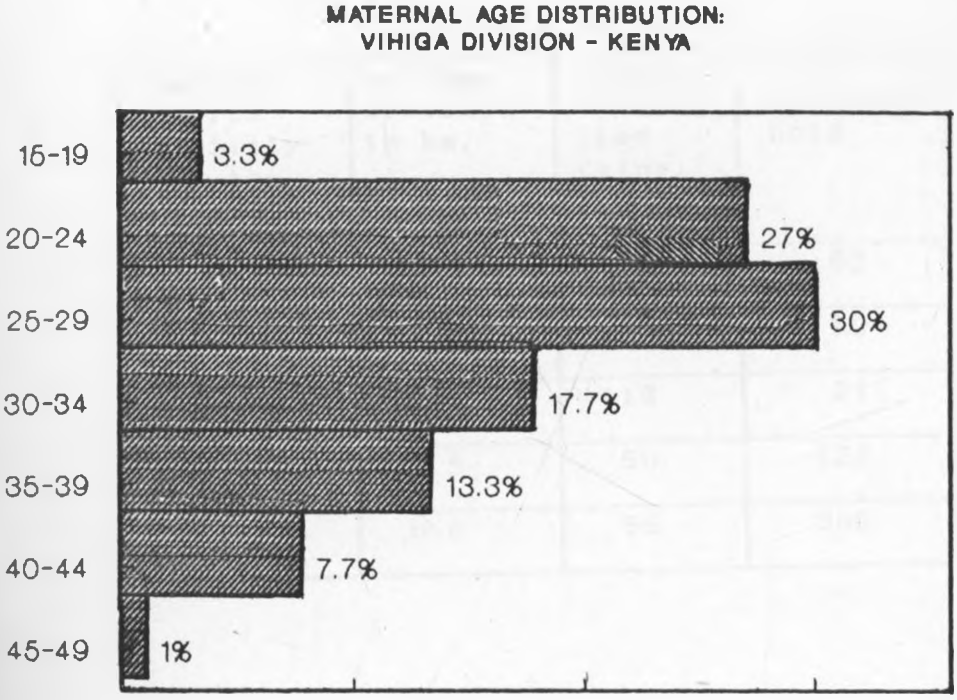
AGE AND SEX DISTRIBUTION OF THE CHILDREN AGED 3-36 MONTHS : VIHIGA DIVISION - KENYA

Age in months	Male (n=155)	Female (n=145)	Totals (n=300)
3-9 (n=77)	14%	12%	26%
10-15 (n=63)	11%	10%	21%
16-26 (n=90)	16%	14%	30%
27-36 (n=70)	13%	10%	23%
Totals	54%	46%	100%

The majority of children (84%) were siblings in the households studied, while the rest were either grand children or relatives to the head of the household.

FIGURE V.3 shows the age distribution of the 300 mothers interviewed. Their ages ranged from 17 to 51 years with the average age being 28.8 years. The highest proportion of mothers were aged between 25-29 years of age. Mothers above the age of 40 years were only 8.7 per cent. This trend is also shown for mothers aged between 15-19 years.

FIGURE V.3



2. Household access to health services

Physical access to the nearest health facility was determined in terms of distance by car in kilometres and walking distance in time. Table 5.3 shows access to the nearest health facility for the households interviewed. The nearest health facility in the division is on average 5.8 km. The average walking time is 55 minutes. People come generally from greater distances at Lianaginga HC.

TABLE 5.3

AVERAGE DISTANCE TO NEAREST HEALTH FACILITY IN KILOMETRES AND WALKING TIME : VIHIGA VIHIGA DIVISION - KENYA

Nearest health facility for the H/hold	Average distance in km.	Average walking time (mins)	Total No. of house hold
Vihiga	5.7	41	60
Sabatia	5.8	57	90
Lianaginga	8.5	116	21
Mbale	5.5	50	129
Totals	5.8	55	300

3. Household sanitary and socio-economic conditions

According to Table 5.4, for the majority of households (79%), the main water source was a spring. The source of water was unprotected for 8.6 per cent of the households, while 9 per cent had piped water. Availability of the water was fairly regular through out the year. Households with pit latrines comprised 96 per cent of the sample.

TABLE 5.4

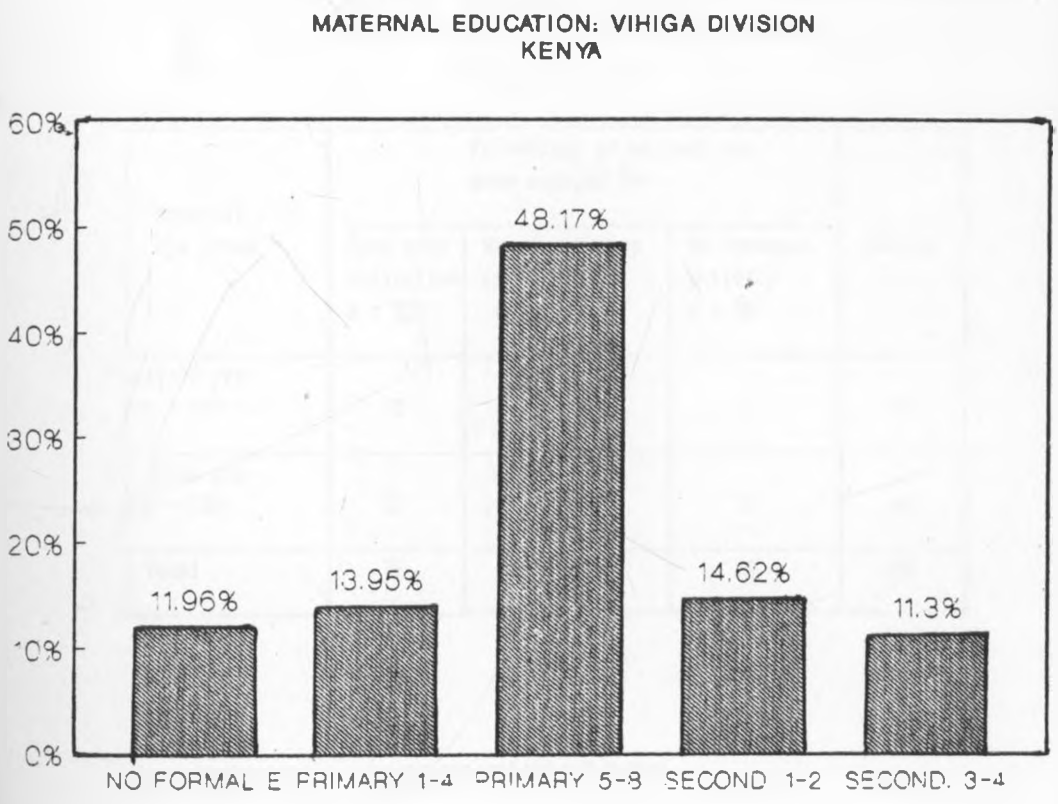
SOURCE AND AVAILABILITY OF WATER TO THE HOUSEHOLD
VIHIGA DIVISION - KENYA

Availability of water to the household	Percentage of households with sources of water as :			Totals
	A protected spring n = 238	An un-pretected well or river n = 26	Tap/other sources n = 37	
Throughout the year n = 250	72	7	5	84
Seasonal n = 50	7	2	7	16
Totals	79	9	12	100

The main fuel used was firewood collected from the bush. Most of the households (60%) had grass thatched houses with mud walls. Those with an iron roof were 36 per cent and permanent were 4 per cent. The Majority of the mothers were Maragoli and belonged to either the Pentecostal or Friends (Quarkers) church. The married mothers were 84 per cent and 47 per cent of those with husbands had husbands who were staying away from home. The average number of live births per woman was 4 and the average number of children alive per woman were 3.7.

Figure V.4 shows that mothers with no formal education comprised 12 per cent, of the sample. The majority (48%) had primary level education and belonged to the older age group (32-51 years).

FIGURE V.4



The majority of the mothers (96%), had no formal employment. Only 4 per cent were either self or wage employed, and they were mainly in the group aged 29-33 years. Also the majority of the women (67%) were not members of any women's group while 33 per cent belonged to a group and these were mainly women aged 34-51 years. For majority of the mothers, the main economic activity was food crop cultivation. Table 5.5 shows that 75 per cent (225) of the mothers were engaged in only food crop cultivation. Mothers with no economic activity tended to be those aged between 17-23 years.

TABLE 5.5

DISTRIBUTION OF MOTHERS BY AGE AND SOCIOECONOMIC STATUS: -VIHIGA DIVISION - KENYA

Maternal Age Group	Percentage of mothers who were engaged in :			Totals
	Food crop cutivation n = 225	Wage/cash crop cultivation n = 38	No economic activity n = 36	
17-28 yrs n = 162	38	4	11	53
29-50 yrs n = 138	37	9	1	47
Total	75	13	12	100

E. STUDY IMPLEMENTATION

Preparations to carry out the investigation were made in August 1986. Piloting and recruitment of a research assistant were done in September and October 1986. The measuring tools were reviewed and modified in November 1986. Final piloting was done in Hamisi Division in December 1986. Measuring tools were finalized in January 1987.

Investigation at the health centres was carried out from mid January 1987 to mid March 1987. The health personnel assisting

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in the community survey were identified and trained towards the end of March. The community survey was carried out from April to the end of May. All the information collected was brought to Nairobi. Data entry and cleaning began in June 1986. First drafts of the write-up were available in November 1986. Preliminary presentation of evaluation results was done in January 1988.

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CHAPTER VI

RESULTS

A. INTRODUCTION

This chapter presents the results of the evaluation of the Nutritional Surveillanc and Growth Monitoring and Promotion (GMP) Programme. First, the results on the technical issues of growth monitoring are presented. The areas covered include : availability of health facility infrastructure, knowledge and skill of the trained personnel, and extent of programme coverage. The information is qualitative and was collected using the techniques of participant observation.

Second, the results of the community survey are presented. The aim of the survey was to identify the household/family characteristics associated with the pre-school child's utilization of growth monitoring services in Vihiga Division. Some of the identified factors include: high child's age at first visit to the health centre, lack of a clinic card and long distance to the nearest health centre.

B. ADEQUACY OF INFRASTRUCTURE

The four health facilities had fairly well maintained and clean grounds. Vihiga HC and Lianaginga health centre were unsatisfactory in two main areas. The buildings are in very poor state of repair and extensive renovations need to be done. These two health facilities also had no clean toilet facilities for the patients and had a very irregular water supply system. Appendix P provides a detailed summary table on the conditions of the four health facility surroundings.

Provision of service areas for growth monitoring activities had been made by all the four health facilities. Most of the service areas were located either inside the buildings or along the corridors. Sitting arrangements were not adequate for all the mothers and no adequate provision had been made for nutrition counseling in all the four health facilities. Appendix Q provides a summary table on the provision of service areas for growth monitoring activities.

The required basic supplementary equipment for growth monitoring was available. The only exception was the nutrition demonstration kit which was not available in any of the health facilities. Table 6.1 shows that the number of functioning weighing scales varied from one to two. The

supply is inadequate given the average number of children weighed per day.

TABLE 6.1

NUMBER OF WEIGHING SCALES AVAILABLE FOR GROWTH MONITORING IN THE HEALTH FACILITIES VIHIGA DIVISION - KENYA

Health facility	dial spring balance salter baby scale	single beam baby scale	single beam platform scale	Total No. of functioning scales	Average No. of children weighed per day	No. of staff weighing
Vihiga	1*	1	0	1	33	2
Sabatia	1	1*	0	1	33	1
Mbale	1*	1	1	2	94	2
Lianaginga	1	1*	1*	1	17	1
Totals	4	4	2	5	177	6

Note * - Not in use - broken down

Vihiga and Mbale Health facilities had Dial spring balance salter baby scales, but the health staff were not using them because they still had to identify a secure place to hang them. The one used in Sabatia had torn shorts and in Lianaginga the screws were loose, the pants were torn and its accuracy was below the acceptable margin. The single beam baby scale was being used only in Vihiga and Mbale. The ones in Sabatia and Lianaginga HC were broken down.

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In all the four health facilities none of the required growth monitoring learning and teaching materials were available in adequate quantities. Vihiga HC and Mbale HC had no child health cards in stock. Sabatia HC had only a limited supply. The four health facilities had no data recording forms in stock or visual aids. The reference booklets were available in Vihiga HC and Mbale RHTC.

The health facilities within the division have a total of 100 health personnel of whom seven were trained in growth monitoring procedures by the District Implementation Team. The training for Sabatia HC and Mbale RHTC personnel was 2 days while the others were trained for 4 days. All except one were deployed in Growth Monitoring activities at the time of the investigation. Given the total pre-school child population of Vihiga Division (36,693) and the number of trained health personnel, the ratio of trained health personnel to pre-school child population is 1:6,115. Table 6.2 shows a further breakdown of the ratios for other specific cadres of health personnel in daily contact with the pre-school child.

TABLE 6.2

THE RATIO OF PRE-SCHOOL CHILD POPULATION TO HEALTH PERSONNEL : VIHIGA DIVISION - KENYA

HEALTH PERSONNEL		PRE-SCHOOL CHILD POPULATION	
cadre	No.	children under 1 yr n = 8,692	children under 5 yrs n = 36,693
NFW	3	1 : 2,897	1 : 12,231
CO	6	1 : 1,449	1 : 6,116
EN	16	1 : 543	1 : 2,293
ECN	27	1 : 322	1 : 1,359
FHFE	9	1 : 966	1 : 4,077
ST	2	1 : 4346	1 : 18,346

Notes :

NFW = Nutrition Field Worker

CO = Clinical Officer

EN = Enrolled Nurse

ECN = Enrolled Community Nurse

FHFE = Family Health Field Educator

ST = Statistical Clerk

Sabatia HF sent for training the CO in charge, the NFW and a STC. Mbale RHTC sent for training only one NFW, and Lianaginga trained the CN in charge of the health facility. Vihiga sent the NFW and one EN, for training. Vihiga is the only health facility where attempts have been made to give on the job training to the STC and two other ECNS involved in immunizations.

Though service areas are available in general, they are crowded and no provision for nutrition counseling has been made. Vihiga HC and Lianaginga SHC are in a poor state of repair with no toilet facilities and a chronic shortage of water. All the four health facilities had low stocks of child health cards and data recording forms. Maximum use should be made of all the available scales to ease crowding in the service areas.

C. KNOWLEDGE AND SKILL OF TRAINED PERSONNEL

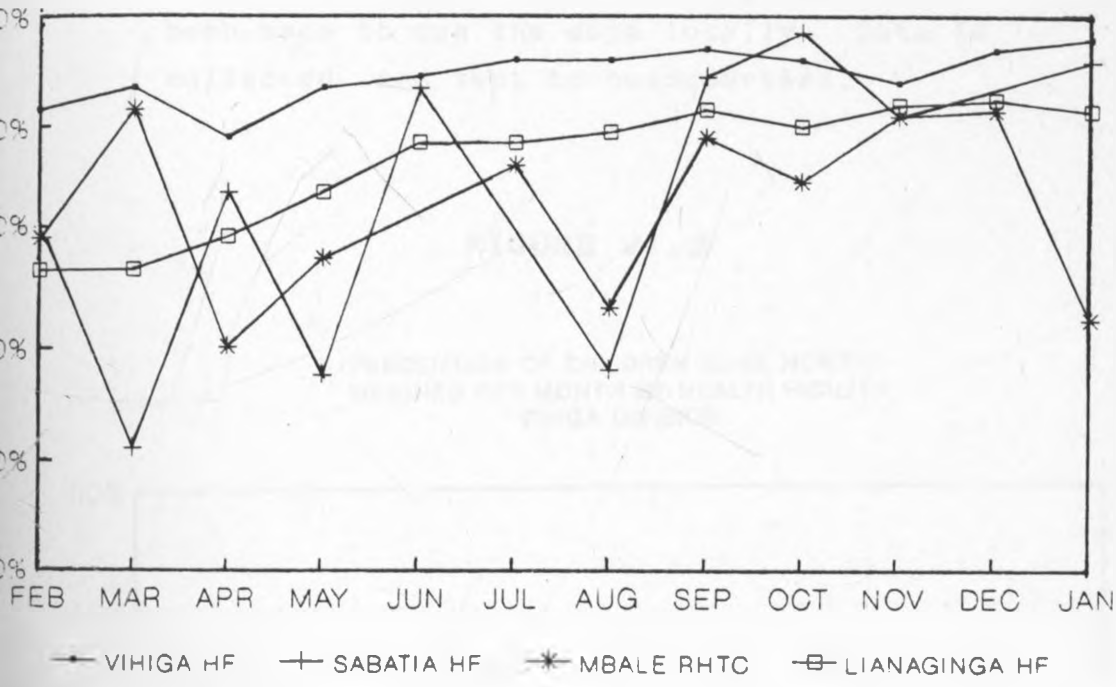
1. Availability and use of Growth Monitoring Data

The growth monitoring records showed that the majority of the children weighed were aged 0-11 months. Figure VI.1 shows the percentage weighed per month from February 1986 January 1987.

On average, in all the four health facilities only a small percentage of children aged 12-35 months were weighed. Figure VI.2 shows that for this age group in the four health facilities there is a declining trend in the percentage weighed per month. But fluctuations are more marked in Sabatia HC.

FIGURE VI.1

PERCENTAGE OF CHILDREN 0-11 MONTHS
WEIGHED PER MONTH BY HEALTH FACILITY
VIHIGA DIVISION



FROM FEBRUARY 1986 TO JANUARY 1987

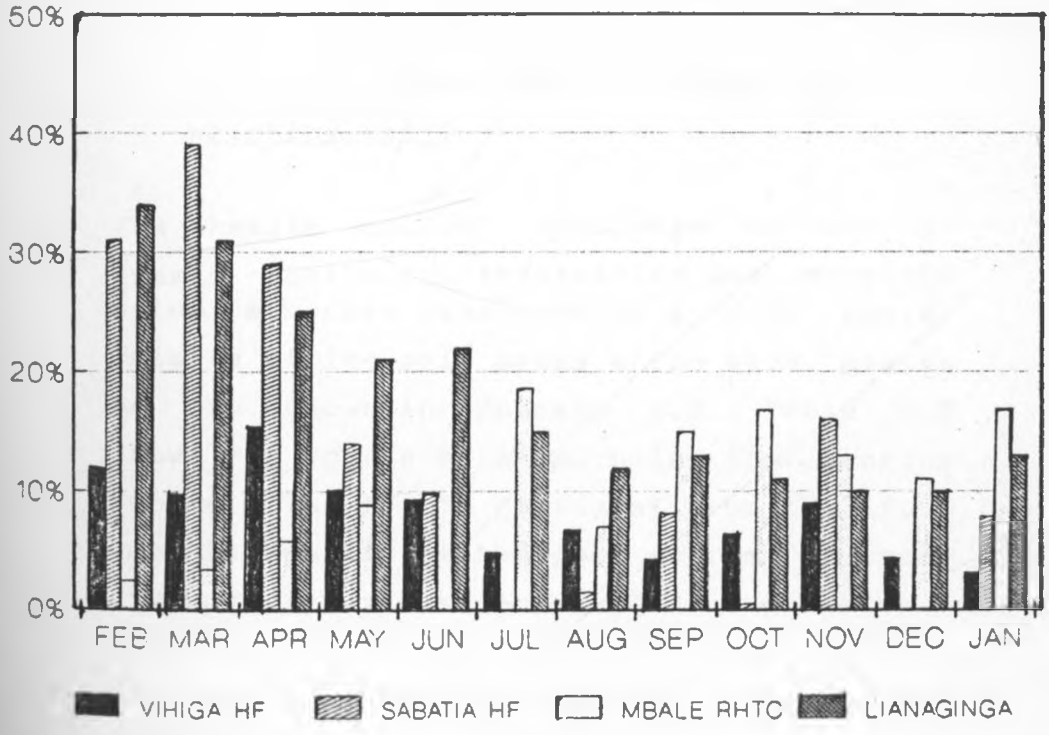
Figures VI.1 and VI.2 show the extent to which data were available in each of the four health facilities within the division. In Sabatia HC, there were no data computed for the months of July and December. The NFW was on leave. This is also shown for Mbale RHTC where data were not compiled for the month of June due to the same reasons.

None of the four health facilities had used the growth monitoring data as intended. After a period of one year, it was

expected that data would be used in graph form as is shown in Figures VI.1 and VI.2 to show the magnitude and trend of the nutritional status of the children attending the health facility. No attempts as yet have been made to use the data locally. Data is collected and sent to headquarters.

FIGURE VI.2

PERCENTAGE OF CHILDREN 12-35 MONTHS WEIGHED PER MONTH BY HEALTH FACILITY VIHIGA DIVISION



FROM FEBRUARY 1986 TO JANUARY 1987

Availability and use of growth monitoring data records were not satisfactory. The follow-up register was not used as expected. Personnel in Sabatia and Mbale health facilities were using wrong procedures in tallying the children being weighed. Not all the one month summary sheets were available in these two health facilities. In Vihiga HC wrong figures were being sent to headquarters. The correct figures had to be re-calculated from the records during the investigation. Appendix R provides a detailed summary table on the availability and maintenance of these records.

2. The health personnel knowledge and weighing skill

The health cadres' knowledge on use of growth monitoring information was measured using a score developed on a 0-50 scale. Details of the main areas which were assessed are shown in Appendix K.3. Table 6.3 shows the scores obtained using the scoring scheme. The health personnel from the four health facilities had poor scores as most did not give the expected correct answers.

A scoring scheme developed to measure the personnel's skill in weighing is shown in Appendix K.1. To obtain a 50 point score, each health worker was required to weigh five children. The scores obtained are

shown in Table 6.3. The highest score was 39 and the lowest 26. None of the health cadres encouraged appropriate participation of the mother in the weighing procedure.

TABLE 6.3

KNOWLEDGE AND SKILL OF TRAINED HEALTH PERSONNEL VIHIGA DIVISION - KENYA

Score	knowledge on use of growth monitoring information n = 7	skill in weighing procedure n = 7
V. poor (0-10)	5	0
Poor (11-20)	2	0
Fair (21-30)	0	2
Good (31-40)	0	5

Attempts were made to assess the counseling skills of the health personnel but this information was not possible to obtain. The health personnel handled a large number of children at the health centres and as such intensive counseling of the mothers was not done as a routine part of growth monitoring.

The health workers knowledge on why data was being collected and how they could be used was below the expected standard especially since some of the issues assessed were covered during the 2-4 day training. The health personnel still weigh the children as part of the daily routine in an MCH clinic. There was no meaningful participation of the mothers in determining for themselves the progress of the child. As such individual advice and personal interaction between workers and mothers were lacking.

3. Accuracy of the weight measurements

To determine the accuracy of the weight measurements, a bag of beans was used. A measurement within the range of ± 100 gms was regarded as an acceptable level of accuracy. All the weighing scales thus tested proved to be within the acceptable range except the ones used in Lianaginga HC and the Beam bathroom scale used in Lianaginga. The health personnel were asked to weigh the bag of beans three times. Only the health worker from Lianaginga was below acceptable limits.

To further check the accuracy of the actual weights plotted on the child health card, 10 children were randomly chosen for each health facility. The weights plotted on the card were compared to the weight of the child obtained by the investigator.

Table 6.4 shows that at the four health facilities most of the weights plotted on the health card were outside the acceptable limits of ± 100 grams. The plotting of these weights on the child health card was satisfactory, though in Lianaginga SHC half of the cards had weights plotted in the wrong months.

TABLE 6.4

ACCURACY AND PLOTTING OF WEIGHT ON CHILD HEALTH CARDS : VIHIGA DIVISION - KENYA

Health facility	Percent of weights out side the ± 100 gms limit N = 40	Percent of weights wrongly plotted on the card N = 40
Mbale	15%	5%
Sabatia	20%	10%
Lianaginga	22.5%	12.5%
Vihiga	17.5%	7.5%
Totals	75%	35%

One health facility still uses a scale in lbs/ozs and its accuracy is below acceptable limits. Generally this type of scale is known to be very inaccurate and can read only to 500 gms. The salter spring dial

scales have an undamped scale motion, making it difficult to read accurately with a child in motion. Appropriate suspension mechanisms both for the scales as well as the child being weighed need to be resolved. None of the scales in use were regularly calibrated.

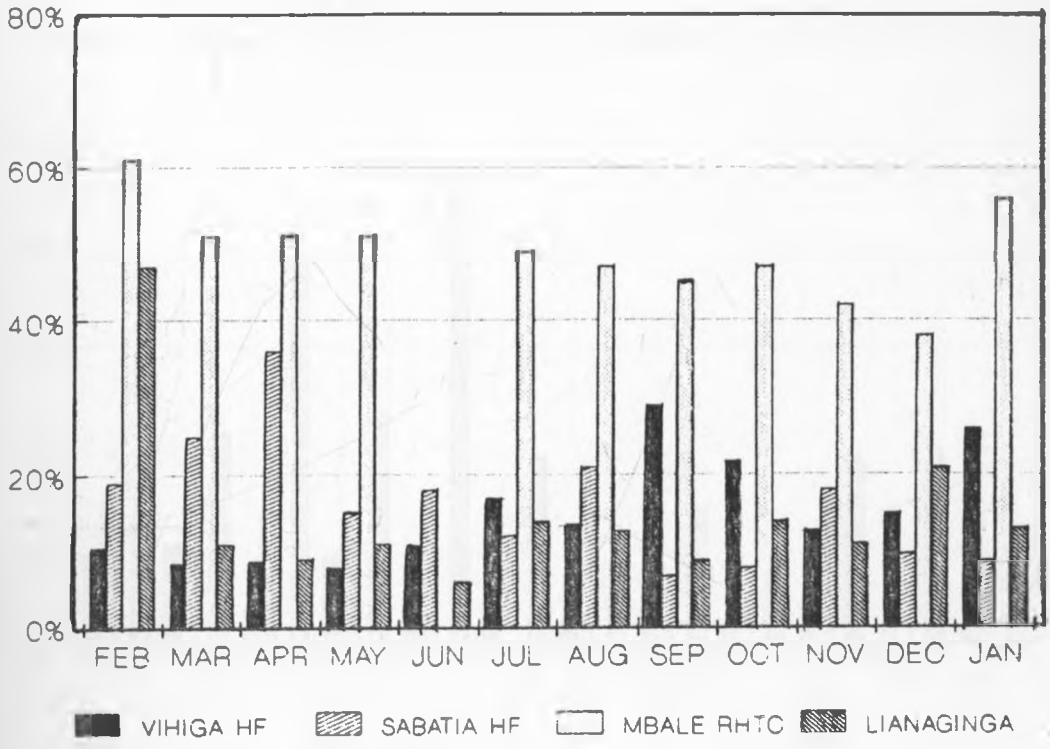
D. EXTENT OF PROGRAMME COVERAGE

Figure VI.3 suggests that Mbale RHTC has the highest percentage of children attending for the first time every month. The average monthly figures for the four health facilities for the period starting February 1986, and ending January 1987 were as follows : Sabatia on average handles about 1,103 children per month. Mbale about 2,868, Vihiga about 1,176 and Lianaginga about 377.

As already mentioned, the majority of the children weighed at the health facility are aged 0-11 months (see Figure VI.1). A small percentage of children aged 12-35 months also attends (see Figure VI.2). The percentage of children 0-11 months classified as being under-weight is shown in Figure VI.4. Lianaginga HC has a fairly high percentage of children identified as being under-weight. This can be attributed to seasonality as well as the quality of records kept.

FIGURE VI.3

PERCENTAGE OF NEW ATTENDERS PER MONTH
BY HEALTH FACILITY- VIHIGA DIVISION

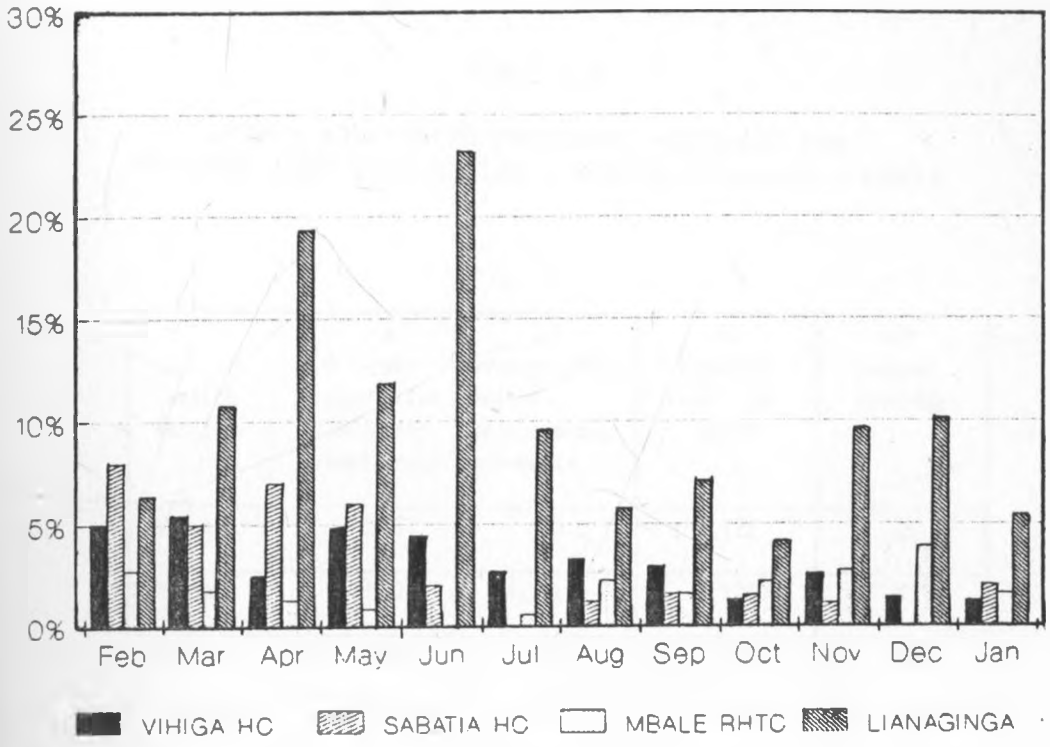


FROM FEBRUARY 1986 TO JANUARY 1987

All the four health facilities had no functioning outreach activities due to logistic problems. Efforts to involve the community in the child growth monitoring programme were not yet fully implemented. The follow-up systems are also not functioning due to transport problems. These limitations affect the number of children being weighed per month. The organization of patient flow indicates that in Sabatia SHC and Vihiga HC the children attending for treatment may not be weighed.

FIGURE VI.4

PERCENTAGE OF CHILDREN 0-11 MONTHS
UNDERWEIGHT PER MONTH BY HEALTH FACILITY



FROM FEBRUARY 1986 TO JANUARY 1987

Assuming an infant mortality rate of 100/1000 for the age group 0-11 months and one expected weight measurement per month, an estimate of the extenT of programme coverage for children aged 0-11 was computed. The estimated figures are shown in Table 6.5 and they ranged from 23 per cent to 39 per cent. Sabatia HC has the lowest percentage. This can be attributed to the records kept at the health centre. Lianaginga has the highest percentage mainly because the pre-school child population in it's catchment

area is fairly low. The average number of children seen every month is also low compared with the numbers seen in the other three health centres.

TABLE 6.5

GROWTH MONITORING PROGRAMME COVERAGE FOR CHILDREN AGED 0-11 MONTHS : VIHIGA DIVISION - KENYA

Health Facility	(a) 0-1 year population in catchment areas	(b) average total weight measurements per month	(c) expected visits per month	(d) percent coverage
Sabatia	2,357	495	2,122	23
Mbale	3,524	1,211	3,172	38
Vihiga	2,075	599	1,868	32
Lianaginga	736	261	663	39
Totals	8,692	2,565	7,823	32

Notes :

a) Estimated 0-1 year population in the catchment areas of the health facilities

b) Calculated average visits per month for each health facility for a total period of 1 year

c) Taking into account an infant mortality of 100/1000 and one weight measurement per child per month

d) Figures in (b) divided by figures in (c) multiplied by 100.

E. UTILIZATION OF GROWTH MONITORING SERVICES

1. Maternal Satisfaction with the health facility

A total of 184 mothers (61%) mothers were satisfied with the general provision of health services. Table 6.6 shows that the majority of these mothers were between the ages of 17-28 years. There is a significant difference (P<.05) between the proportions of older and younger mothers who were satisfied with the nearest health facility. This could mean that the younger mothers' contact with the health facility is minimal compared to the older mothers or that their expectations and level of education are higher.

TABLE 6.6

MATERNAL SATISFACTION WITH THE NEAREST HEALTH FACILITY BY AGE: VIHIGA DIVISION - KENYA

Maternal Age group	Mothers for whom the nearest health facility was			
	satisfactory		Not satisfactory	
	n	%	n	%
< 28 yrs (15-20) n=162	104	34.6	58	19.3
>28 yrs (29-55)	80	26.6	58	19.3
Totals	184	61.3	116	38.6

Table 6.7 shows a further breakdown of the 116 mothers not satisfied with the health facility. Mothers completely disatisfied with any of the services were 9.3 per cent, followed by 8.7 per cent disatisfied with supply of drugs, and 5.3 per cent disatisfied with the behaviour of health personnel.

TABLE 6.7

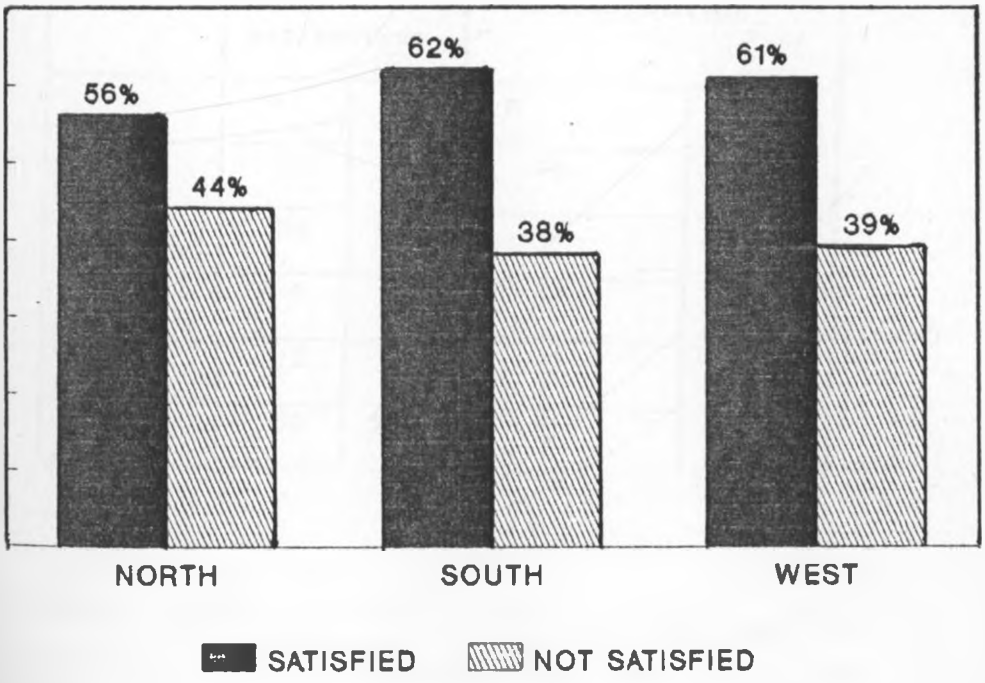
REASONS FOR MATERNAL DISATISFACTION WITH THE NEAREST HEALTH FACILITY : VIHIGA DIVISION - KENYA

Dissatisfaction with	Total No. of mothers n=300	PERCENTAGE
The health services	28	9.3
Drugs supply	26	8.7
Personnel behaviour	16	5.3
Location of the health facility	15	5
Waiting time at the heatlh facility	14	4.7
Advice/information given by health personnel	13	4.3
Length of working hours	4	1.3
Total	116	38.6

Figure VI.5 shows that the highest proportion of those not satisfied came from the Northh location. The nearest health facilities for these mothers is Sabatia health centre which waa found to have inadequate growth monitoring facilities and staff traininga took only a period of two days. Only one person was involved in the programme The majority of the patients attend the HC when there are drugs available.

FIGURE VI.5

MATERNAL SATISFACTION WITH THE NEAREST HEALTH FACILITY BY LOCATION: VIHIGA DIVISION - KENYA



2. Maternal interpretation of the growth curve

Mothers were asked to explain three different child growth patterns, namely, weight gain, but below the standard growth curve no weight gain, and loss of weight (see Appendix L). Table 6.8 shows that the majority of the mothers, 77.7 per cent (232), made no attempt to interpret the growth trends.

TABLE 6.8

DISTRIBUTION OF MOTHERS BY AGE AND THEIR INTERPRETATION OF THE GROWTH CURVE. VIHIGA DIVISION - KENYA

Mothers' Age group	Mothers who gave			
	Some explanation		No explanation	
	n	%	n	%
17-23	22	7.3	46	15.3
24-28	34	11.3	60	20.0
29-33	5	1.7	57	19.0
35-51	7	2.3	69	23.0
Totals	68	22.7	232	77.7

Though 22.7 percent made an attempt to explain the growth patterns, only 11 per cent (34) gave a satisfactory explanation of the causes of the three different growth trends. These again tended to be younger

mothers aged between 24-28 years and with higher levels of education. Most mothers felt that this was the health facility's clinic card and had not paid very much attention to it.

3. Child's contact with the health facility

The average time it took to reach the nearest health facility by walking was estimated to be 54 minutes. The nearest health facility was used most of the time by 75 per cent (223) of the households. The main reason for using the nearest health facility as reported by 40 per cent (119) of the households was because it was a government health centre and for only 20 per cent (61) it was beacuse of availability of free drugs.

The majority of the children, 60 per cent (179), were born at home, 30 per cent (93) were born in the hospitals outside the division and 10 per cent (30) were born at the health centres within the division. Vihiga South location had the highest percentage of children born at home.

Table 6.9 suggests that most of the children had clinic documents. Thirty nine per cent (114) had the new child health card, and 48 per cent (144) possessed the old child health card, or documents which were either outpatient cards, or birth notification papers.

It was noted that treatment, immunization and weights were recorded on some of these documents. The table also shows that the new child health card was mostly possessed by children below the age of 15 months and other types of documents were was possessed mostly by the children above 15 months of age. The children with no documents available were 14% (42). For 26 per cent (11) of those with no documents, the mothers had received antenatal assistance during pregnancy only from the traditional birth attendant.

TABLE 6.9

DISTRITION OF CHILDREN BY AGE AND TYPES OF CLINIC DOCUMENTS AVAILABLE: VIHIGA DIVISION-KENYA

Type of document	Child's age % having document.		Totals n=300
	<15 months n=140	>15 months n=160	n=300
New child hlth card n=114	32	6	38
Other types of documents n=143	9	39	46
No documents available n=43	6	8	14
Totals n= 300	47	53	100

Children whose documents were in good condition were 33 per cent (100). Risk factors were not filled in any of the clinic cards. In fact 99 percent of the new child health cards had this crucial information missing. On the other hand weight was correctly plotted on 50 per cent (151) of the child health cards. It should be noted that 28 per cent (84) of the children had documents for which weight plotting was not applicable.Table 6.10 shows that for 40 per cent (121)of the mother, the main reason for visiting the health facility was to attend clinic.

TABLE 6.10

CHILD'S MOST RECENT CONTACT WITH THE NEAREST HEALTH FACILITY : VIHIGA DIVISION - KENYA

Most recent visit to nearest HF	Percentage of children who visited the HF for :		Totals
	Clinic n=121	Treatment n=143	
During the month of study n=50	7	10	17
2-3 months ago n=103	15	19	34
>3 months ago n=147	18	19	49
Totals	40	48	100

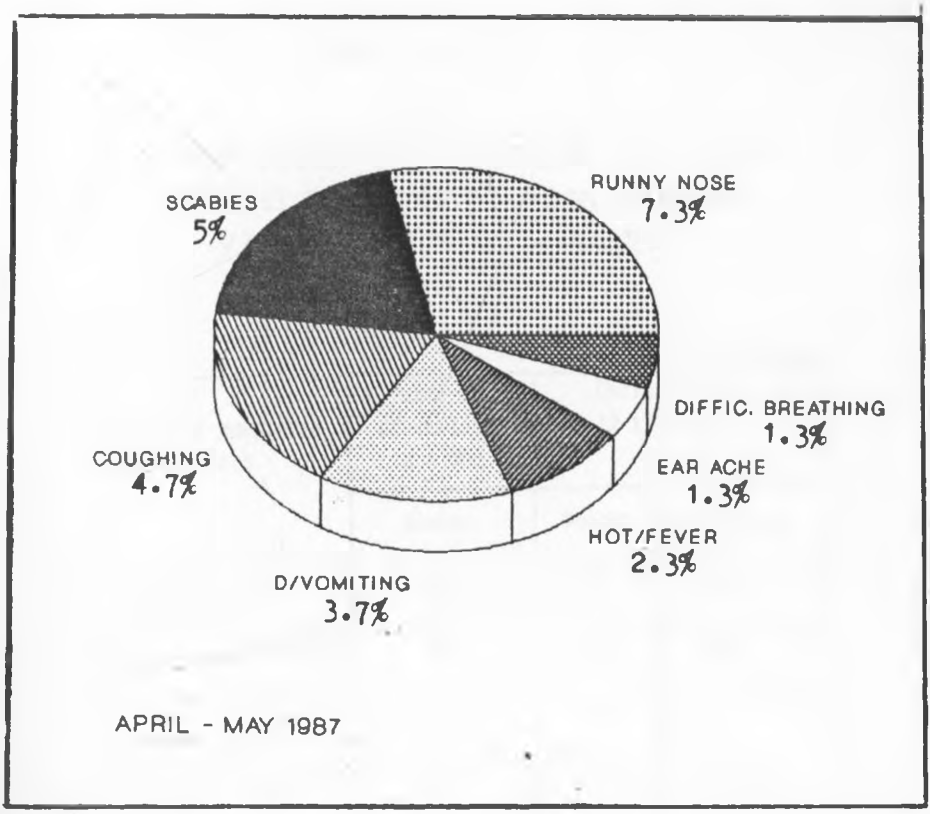
For forty eight per cent (143) of the mothers, the main reason for visiting the health facility was to get treatment. From this table it can be seen that only 7 per-cent (21) of the children had visited the health facility during the month prior to the date of the interview.

4. Health status

Generally North Maragoli location had the highest percentage of pre-school children reported to have suffered from scabies, diarrhoea and vomiting, while West Maragoli had the highest percentage reported to have suffered from fever and cough. Though 74% of the children were reported to be well, for those sick, duration of illness was greater than 5 days irrespective of the child's age. Figure VI.6 shows the break down of the major causes of ill health among the 300 children aged 3-36 months. Seventy four per cent of the children were reported to be well. The percentage of children reported sick with symptoms of scabies were 5%, coughing 4.7%, diarrhoea and vomiting 3.7%, hot with fever 2.3%, runny nose 7.3%, ear ache 1.3% and difficult breathing 1.3%.

FIGURE VI.6

HEALTH STATUS OF CHILDREN AGED 3 - 36 MONTHS: VIHIGA DIVISION KENYA



5. Immunization status

Children with no record of immunizations were 17 per cent (52). The BCG scar was found in 83 per cent (250) of the children. The records available showed that 37 percent of the children had received measles vaccine. Children eligible for this vaccine but not

immunized were 31 per cent (94). Children aged 12-17 months were 18 percent (53). Table 6.11 shows the percentage distribution of the number of completed immunizations for this age group.

TABLE 6.11

DISRIBUTION OF CHILDREN AGED 12-17 MONTHS BY IMMUNIZATION STATUS: VIHIGA DIVISION - KENYA.

Record of completed Immunizations	Total No. of children n = 300	Children aged 12-17 months n = 53	
	Number	Number	Percentage
None completed	21	3	5.66
Only one Imm. complete	68	12	22.4
Two Imm. completed	32	6	1.32
Three Imm. completed	47	5	9.43
Four Imm. completed	103	24	45.28
No record available	30	3	5.66
Totals	300	53	17.7

6. Nutrition status

Nutritional status was assessed by three indicators: weight-for-height, height-for-age, and weight-for-age. Table 6.12 shows that the highest percentage of children with a weight-for-age below -2SD were children aged 12-23 months. The highest percentage of those with a weight for age above -2SD were younger children aged 3-11 months

TABLE 6.12

PERCENTAGE OF CHILDREN UNDER-NOURISHED ACCORDING TO WEIGHT FOR AGE : VIHIGA DIVISION - KENYA

WEIGHT/AGE Z score	3-11 months n=101	12-23 months n=102	24-36 months n=95	Totlas n=300
Below -2SD N = 57	2%	11%	6%	19%
Above -2SD N = 243	31.7%	23%	26.3%	81%
Totals	33.7%	34%	32.3%	100%

According to Table 6.13, children severely malnourished or wasted and stunted were 3.7% (11). On the other hand children stunted but not wasted were 8.7% (26) with an average age of 22.9 months. Children who were wasted but not stunted were 23 percent (69) with an average age of 20.5 months. The

nutrition status data show that malnutrition is more advanced in the older children and that weaning of children could be a problem in the community.

TABLE 6.13

PERCENTAGE OF CHILDREN WASTED AND STUNTED ACCORDING TO WEIGHT FOR HEIGHT AND HEIGHT FOR AGE : VIHIGA DIVISION - KENYA

HEIGHT/ AGE Z SCORE	WEIGHT/HEIGHT				TOTALS	
	Below -2SD (wasted)		Above -2SD (normal)			
	Percentage n=96	Average Age	Percentage n=204	Average Age	Percentage n=300	Average Age
Below -2SD (stunted) n=57	3.7%	27.7	8.7%	22.9	12.4%	29.9
Above -2SD (normal) n=243	23%	20.5	64.6%	17	87.6%	17.9

As shown by Table 6.14, of the 57 children having a weight for below -2SD of the NCHS standard, 4 per cent (12) had no BCG scars, 11 per cent (28) had no record of measles immunization though they were eligible and 4 per cent (12) had no record of having been growth monitored.

TABLE 6.14

PERCENTAGE OF CHILDREN WITH NO BCG SCAR, NO RECORD OF MEASLES IMMUNIZATION, NO RECORD OF GROWTH MONITORING AND UNDERWEIGHT ACCORDING TO WEIGHT FOR AGE : VIHIGA DIVISION - KENYA

Weight/ age Z score	PERCENTAGE OF CHILDREN WITH NO:		
	BCG scar n=50	Record of measles immunization n=94	Record of growth monitoring n=53
Below -2SD n=57	4	11	4
Above -2SD n=243	12	20	13
Totals	16	31	17

7. Extent of growth monitoring

Regardless of the type of clinic documents, the average number of times the child had been growth monitored was below the expected frequency. The average age at first immunization and first weight record was 3 months. The average number of visits to the nearest health facility per child was 5. The available records showed that on average, the child's growth had been monitored at least 3 times. Table 6.15 shows that children aged 3-12 months had better growth monitoring utilization rates than the older children. This is a period when the health facility is most likely to be used for immunization purposes.

TABLE 6.15

UTILIZATION RATES FOR GROWTH MONITORING SERVICES BY AGE GROUP : VIHIGA DIVISION - KENYA

Age of the child (months)	ESTIMATED AVERAGE			Rates of Utilization (d)
	Time lapse (months) (a)	Number of times weighed (b)	Expected frequency for No. of weight measurements (c)	
3-12 n=112	1.8	2	7	29%
13-24 n=104	2.9	2.5	15	16%
25-36 n=84	3.5	1.4	21	6.6%
all children	2.8	3	14	21%

Notes :

a) Estimated time in months from the date of last known weight record to the date of the interview.

b) The total numbers of times the child had been weighed as obtained from all the available clinic records.

c) Calculated on the basis of the child's age, and number of times they should have been weighed. The expected frequency used was : from 0-12 months to be weighed once a month; from 13-36 months to be weighed once every two months.

d) Rate of utilization calculated as :value in b divided by c, and multiply by 100.

The total number of children identified as having no record of growth monitoring were 24.7 per cent (74). Table 6.16 shows that the majority of these children were aged 25-

36 months. This is an age group where clinic immunizations are finished, documents are likely to be unavailable, and health facility visits would be for treatment purposes.

TABLE 6.16

DISTRIBUTION OF CHILDREN BY AGE AND AVAILABLE INFORMATION ON GROWTH MONITORING VIHIGA DIVISION - KENYA

Child's age in months	Percentage of children with		Totals
	No record of growth monitoring n=74	Record of at least one weight measurement n=226	n=300
3-12 n=112	8	29.3	37.3
13-24 n=104	5	29.7	34.7
25-36 n=84	11.6	16.3	28
Totals	24.6	75.3	100

As already mentioned, the average number of health facility visits per child was 5. Table 6.17 shows that the majority of children with a record of having been growth monitored at least once had their nearest health facility as Mbale RHTC. This is mainly because this health facility acts as a referral hospital for the other health

centres within the division. Organization of patient lines of flow shows that the children that visit this health facility are weighed before being attended to.

TABLE 6.17

DISTRIBUTION OF CHILDREN BY NEAREST HEALTH CENTRE AND RECORD OF GROWTH MONITORING VIHIGA DIVISION - KENYA

Nearest health facility	PERCENTAGE OF CHILDREN WITH:		Totals n=300
	No record of growth monitoring n=74	Record of at least one weight measurement n=226	
Vihiga/ Lianaginga	5.3	21.7	27
Sabatia	9.7	20.3	30
Mbale	9.7	33.3	43
Totals	24.7	75.3	100

The minimally acceptable level of growth monitoring has already been discussed (Chaudhuri, S.N., (1988)). This was determined by comparing the number of times the child had been weighed to the expected frequency of monitoring expressed as a percentage. Growth monitoring levels were assigned according to quartile ranks. As already mentioned, at least half (50%) of the children had their first weight record between birth and three months, and also 50

percent of the children had documents to show that their weight had been monitored at least 3 times.

Children 0-12 months should have been weighed once a month and children 13-36 months at least once every two months. On the basis of this expected frequency Table 6.18 shows that the first quarter of children had 0% of the expected monitoring frequency. The second quarter of the children had a range of 0.1% - 19% of the expected monitoring frequency. The third quarter of the children had a range of 20% - 33% of the expected monitoring frequency. The fourth quarter of the children had a range of 34% - 100% of the expected monitoring frequency.

TABLE 6:18

GROWTH MONITORING LEVEL BY PRE-SCHOOL CHILD'S AGE : VIHIGA DIVISION - KENYA

Child's Age (months)	PERCENTAGE OF EXPECTED MONITORING FREQUENCY: 1st Quartile 0.0% n=74	2nd Quartile 19% n=80	3rd Quartile 33% n=79	4th Quartile 100% n=67	Totals n=300
3-12 months n=112	8%	3.6%	9.3%	16%	37%
13-36 months n=188	16.7%	23.1%	17%	6%	63%
Totals	24.7%	26.7%	26.3%	22%	100%

Table 6.19 shows that majority of the children in the fourth quarter had Mbale RHTC as their nearest health facility while majority of the children with no record of growth monitoring had Sabatia HC as their nearest health facility. This implies that either the expected frequency is too high or the programme has not been able to achieve optimal levels of monitoring for the majority of the children. This is more evident in older children who might have finished their immunizations.

TABLE 6.19

GROWTH MONITORING LEVEL AND NEAREST HEALTH FACILITY : VIHIGA DIVISION - KENYA

Nearest Health Facility	PERCENTAGE OF EXPECTED MONITORING FREQUENCY:				Totals
	1st Quartile 0.0% n=74	2nd Quartile 19% n=80	3rd Quartile 33% n=79	4th Quartile 100% n=67	n=300
Vihiga/ Lianaginga n=81	5.3	7	8.3	6.3	27
Mbale n=129	9.7	12	11	10.3	43
Sabatia n=90	9.7	7.7	7	5.7	30
Totals	24.7	26.7	26.3	22.3	100

Eleven percent (34) of the children had their weights monitored 50 percent of the expected frequency. Two children (less than 1%) had their growth monitored as expected. The majority of the children in the fourth quarter were aged 3-6 months and the majority in the first quarter were aged 23-36 months.

Results of the investigation show that children aged 3-12 months have better growth monitoring service utilization rates. Though 24% had no record of having been weighed, 50% had been weighed at least three times. Presence (1) or absence (0) of three weight records was used as a dependant variable in a Multiple classification analysis.

The results in table 6.20 show that the overall probabiliyt of the child aged 3-36 months having at least 3 weight records is 32% with a multiple correlation ratio (R^2) of 52%. Continous contact with the GM/P programme for the target group is also closely associated with the following preschool child attibutes: Age at firstweight record, age at the time of the survey and availability of clinic records.

Those children weighed for the first time before the age of two momths have a better chances of being monitored more. Foe children with no clinic documents, the probability of having been weighed at least

three times is 42%. This is because though 14% of the children had no document, 48% had other types of treatment records (see Table 6.9)

TABLE 6.20

SUMMARY STATISTICS ON SELECTED PRE-SCHOOL CHILD VARIABLES ASSOCIATED WITH UTILIZATION OF GROWTH MONITORING SERVICES : VIHIGA DIVISION - KENYA

Independednt Variables	Children		Probability of a child having at least 3 weight records	Eta^2	$Beta^2$
	No.	%			
1. Child's age at 1st weight record				0.197	0.198
1. At birth	73	24.3	0.01		
2. At 1-2 months	88	29.3	0.53		
3. At 3-4 months	71	23.7	0.39		
4. At 5-6 months	36	12	0.42		
5. 6 months	32	10.7	0.13		
2. Child's present Age				0.066	0.079
1. 3-9 months	77		0.17		
2. 10-15 months	63		0.49		
3. 16-26 months	90		0.38		
4. 27-37 months	70		0.24		
3. Child's clinic card is				0.085	0.004
1. Available	217		0.40		
2. Not available	83		0.10		
Overall mean = .32 r^2 = .52					

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Independednt Variables	Children		Probability of a child having at least 3 weight records	Eta^2	$Beta^2$
	No.	%			
1. Child's age at 1st weight record				0.197	0.198
1. At birth	73	24.3	0.01		
2. At 1-2 months	88	29.3	0.53		
3. At 3-4 months	71	23.7	0.39		
4. At 5-6 months	36	12	0.42		
5. 6 months	32	10.7	0.13		
2. Child's present Age				0.066	0.079
1. 3-9 months	77		0.17		
2. 10-15 months	63		0.49		
3. 16-26 months	90		0.38		
4. 27-37 months	70		0.24		
3. Child's clinic card is				0.085	0.004
1. Available	217		0.40		
2. Not available	83		0.10		
Overall mean = .32 r^2 = .52					

Additional analysis was also done on household variables likely to influence the pre-school child's utilization of the growth monitoring services. Table 6.21 provides the summary statistics on these variables. The results show that at household level the overall probability of the household having a pre-school age child with at least three weight records is 32% with a multiple correlation ratio (R^2) of 21%. This level of utilization is closely associated with the following household attributes. The identified nearest health centre, distance to this health centre, frequency of its use and the sub-location in which the household is located.

Among these variables, the nearest health facility, followed in order by distance and administrative location are the the most important in terms of explaining the variation of progaramme utilization. The probability is highest at 79% for those households whose identified nearest health centre was Vihiga. As shown in Table 5.3. Vihiga health centre on average has the least walking time of 41 minutes and the highest percentage of children weighed per month (Fig. VI.4)

TABLE 6.21

SUMMARY STATISTICS ON SELECTED HOUSEHOLD VARIABLES ASSOCIATED WITH PRE-SCHOOL CHILD UTILIZATION OF GROWTH MONITORING SERVICES : VIHIGA DIVISION - KENYA

Independednt Variables	Households		Probability of a child having at least 3 weight records	Eta^2	$Beta^2$
	No.	%			
1. Nearest HF				0.033	0.058
1. Vihiga	60	20	0.47		
2. Sabatia	91	30.3	0.22		
3. Mbale	129	43	0.30		
4. Lianaginga	20	6.7	0.32		
2. Distance to HF				0.005	0.005
1. <30 minutes	129	43	0.29		
2. 30-60 minutes	73	24.3	0.37		
3. >60 minutes	98	32.7	0.33		
3. Location				0.016	0.004
1. North	70	23.3	0.21		
2. South	120	40	0.37		
3. West	110	36.7	0.32		
4. Frequency of HF use				0.001	0.004
1. Often	224	74.7	0.31		
2. Sometime	54	18	0.33		
3. Never used	22	7.3	0.36		
Overall mean = .32 r^2 = 0.21					

In conclusion, the results presented suggest that care must be taken when general objectives for child growth monitoring set at national level are adopted locally. A situational analysis should be made based on information collected on programme implementation and household/family factors likely to influence utilization of the services by the target population. This will provide a clearer desciption of progamme implementation at the local level. Programme objectives and priorities tailored to meet the needs of the local situation should be made based on this information. Chapter seven looks at the administrative and logistic barriers as well as facilitating mechanisms that need to be changed in order to improve the GM/P programme in Vihiga Division.

CHAPTER VII

DISCUSSION

A. INTRODUCTION

Growth monitoring is seen by many to be the most difficult part of the GOBI package. As such the monumental efforts made by the Ministry of Health, Government of Kenya, to implement Nutritional surveillance and GMP programme in nine pilot districts are commendable. This is a positive step towards the belief that growth monitoring really has something to contribute to child survival and development. In addition, efforts are also being made to incorporate into the initial training of all the relevant health cadres the technique of growth monitoring and ways of communicating the importance of good child growth and how it may be achieved by mothers.

To improve the health and nutrition of the pre-school child population, the nutritional surveillance GM/P programme has focused its energy and resources on the use of the Growth Chart to monitor the pattern of growth of each individual child. Emphasis has been put on the action the health worker should

take when early signs of growth faltering are identified. Two questions are raised in connection with this objective. First, are the health facility strategies for reaching and providing Growth Monitoring services to the pre-school child population consistent

Is it providing appropriate and adequate services to all potential targets?. Second, does the pre-school child remain in the programme as planned or do household/family factors determine the nature of his/her participation.

In an attempt to answer the above questions an investigation was designed to assess two aspects of the Nutritional surveillance and GMP programme: quality of the services delivered and the extent of programme coverage. For quality of services being delivered to be satisfactory and acceptable, appropriate growth monitoring procedures have to be implemented, and the relevant and planned services be delivered. For the Growth Monitoring programmes this depends on three factors : first, the extent to which optimal access to the interventions of the programme for the target population has been achieved as indicated by provision of the necessary and appropriate structures, equipment and materials. Second, the extent to which the services offered meet growth monitoring requirements as

indicated by adequate organization and implementation of relevant and appropriate growth monitoring procedures. Third, the extent to which competence of personnel meet growth monitoring requirements as indicated by type of training and personnell skills in the different growth monitoring activities.

B. PROVISION OF ADEQUATE INFRASTRUCTURE

Analysis of the data shows that for the majority of the children optimal levels of growth monitoring have not been achieved. Even though by the age of 3 months, most of the children would have been weighed at least once, subsequent visits to the health facility specifically for growth monitoring are below the expected frequency. Contributory factors are many, and this chapter highlights the main ones.

Basically, Growth Monitoring and Promotion (GMP) is the regular measurement, recording and interpretation of child's growth trend in order to counsel, act, and follow up results. Promotion has been added because monitoring alone emphasizes assessment rather than action. The concept of growth monitoring is a persuasive one, and during the past ten years, growth monitoring has been introduced into many programmes throughout the world.

Large scale programmes with an adequately functioning GMP component have been rare mainly because of problems with: scales, growth charts, interpretation of monitoring results and effective action. Lack of resources including available time and personnel as well as training and supervision have often been major bottle-necks (Taylor,C.E. (1988) Hendrata, L., & Rohde, J.E., (1988) Grant. J., (1985) Gopalan. C., & Chatterjee, M., (9185)).

The results of this investigation show that a wide variety of scales have been supplied to the health centres. Some measuring in kilograms and some in pounds. The condition of these scales indicates that whatever scale design is in use and available to the worker great care should be taken to ensure that: spare parts; servicing, and routine checking of the scales is done. Suspension mechanisms for hanging scales need to be provided. The parts that go with these scales at the moment are not durable nor suitable for weighing very young children. Weighing scales need to be recalibrated and their accuracy verified on a regular basis (Burns, J.O., & Rohde, J.E., (1988)).

Normal monthly weight gain beyond 12 months of age is less than 200 gms. Growth faltering is not adequately accentuated on the present growth chart particularly for this age group mainly because 500 gm and not 100gm divi-

sions have been used on the chart. Though production costs of cards were kept to the absolute minimum, the end product has been a very cheap growth card with a very short life span. This cannot accommodate the five year age limit. An adequate distribution, supply, and ordering system needs to be set up to make sure that charts are available at the local level. This should take care of not only the growth charts but also educational materials and appropriate forms for recording data.

C. IMPLEMENTATION OF GROWTH MONITORING PROCEDURES

Assessment of organization of target group recruitment procedures shows that these are not conducive to retention of the pre-school child in the programme. First, though only 14 percent of the children had no clinic documents, crucial information on risk factors was missing on all the growth charts. Second, no attempts were made to transfer all the information on bits and pieces of paper to the growth chart when the child eventually got it.

The growth monitoring records were poorly maintained and inappropriately used. The available data on children at risk and needing follow-up are incomplete. Figures in headquarters could be misleading especially since observations done during the investigation revealed that figures which passed from

the growth cards to the clinic records, to the District headquarters and finally to the headquarters have inaccuracies introduced at each step. An evaluation of child health clinics in rural Papua New Guinea carried out by Lennox drew similar conclusions (Editorial: Lancet (1986)).

Though data are regularly collected no feedback has been relayed back to the health facilities. In my view, this helps to emphasis the idea that data are being collected for headquarters rather than for use by the health facilities. The danger is that growth monitoring is being regarded and will continue to be regarded as an extension of the health information system rather than an extension of the health delivery system at the health centre.

Observation of patient lines of flow in the health centres within the division shows that not all the children who attend have their weights monitored. It is apparent that the basic structuring of the growth monitoring sessions needs proper preparation and logistic support. This need not be complicated but it does require planning and supervision. To minimize the time mothers wait, and decrease confusion during the actual weighing and recording, the series of steps or stations outlined by Morley should be established at each growth monitoring session in the MCH/FP clinics (Morley, D., (1963) Morley, D.,(1973a)). To some extent this will help to

ensure that each mother is included in the process of growth monitoring and is involved in meaningful discussion of her child's weight results (Maraa, G., (19985)).

The Nutritional Surveillance and GMP programme is basically health facility based. Results of the community survey show that the majority of the mothers still regard the child's growth chart as the property of the clinic. In this respect, the growth chart was shown to be poorly understood by mothers with only a minority of respondents showing evidence of understanding. The majority of the mothers also expressed dissatisfaction with the general provision of health care. To tackle these two major issues and to enhance the credibility of growth monitoring the programme needs to ensure that appropriate interventions are used when the screening identifies growth faltering. One of the areas that needs support and direction is the means used to provide nutrition counseling.

The nutrition status data shows that a high proportion of children aged 12-23 months had a weight-for-age below -2 SD. This to some extent can be attributed to weaning problems in the community. The parents ability to understand the weight record of the child is one of the essential steps in tackling child weaning problems. Several studies have shown that an initial investment in training the mother/family helps in overcoming some of the

major problems of weaning related to bulk, frequency and energy density of the weaning foods.

D. LIMITATIONS OF THE HEALTH PERSONNELL TRAINING

To enhance credibility of growth monitoring and to build a better rapport between the mother and the health worker, nutrition education efforts must be given support and more appropriate strategies developed at the health facility level. Maximum use must be made of the growth monitoring manuals. It is apparent that the two day training dwelt on how to fill the new data forms and not on what action should be taken when growth faltering occurs. A similar study done in St. Lucia, West Indies, concluded that understanding of the growth pattern is largely determined by the motivation, interest, and the time available to the health centre staff (Owen, M.R., & Owen, P.J., (1983)).

One of the main areas of concern related to personnel training was the apparent emphasis put on the use of the child's absolute position on the growth chart for the reporting system. This to some extent reinforces the health worker's believe that this is what is

really important rather than whether or not the child has gained or lost weight, no information is collected on the children's growth trends. From the kind of information presently being collected it is difficult to know the first attenders who are under-weight. or those above the 50th centile but loosing weight. This is crucial information in trying to estimate the prevalence of under-nutrition in the community and the extent to which the nutrition trends shown by clinic children are representative of the general situation in the community (Serdule, M.K. et al (1987)).

This is an area which should be given considerable thought because the aim in nutritional surveillance is to establish sentinel zones in each district from which nutrition status dat can be collected on a continous basis. The mere measurement of nutritional status alone being done in the health facilities in the division only presents information on what has already occurred without addressing the factors influencing it. Serious thoughts should be given to the possibility of incorporating other variables into the surveillance system. In fact making such a system community based is the only way of gaining considerable insight into the factors which have an impact on nutritional well-being of the pre-school child.

Studies on use of nutrition status data for surveillance purposes conclude that with the additional variables, inter pretation of

the nutritional status data becomes more meaningful as it will allow for associations to be drawn and invaluable information for planning and targeting nutrition programmes will also be provided. In addition, the use of cut-off points based on the percentage of the reference median weight/age values being used are not consistent across age groups and are potentially misleading when interpretating nutritional surveillance data. Ways of incorporating SD scores should be investigated as these provide more consistent statistical expressions at different ages.

E. CONCLUSIONS

The results of this investigation show that growth monitoring in Vihiga Division is not a routine affair in families and the community. It is still a special procedure for those who are more accessible and for children whose parents are more health conscious.

There is a definite need for growth monitoring of individual children. But the system of recording and reporting must ensure coverage of the entire vulnerable population. Often overlooked is the cost to mother and child. It is obvious that the time and effort needed to travel to the weighing centres as well as the waiting time limit the extent of programme coverage. In addition, a clear

distinction must be made between the resources used for monitoring growth and the resources required for the resultant actions. These are crucial issues if programme implementation is to be a success.

Through proper training, supportive supervision and through effective linkage between the health worker and the community, it should be possible to provide effective nutrition services to the pre-school child supported and facilitated by meaningful growth monitoring.

Data from the community survey and the health centres show that it is not possible for the health centres in Vihiga Division to be able to weigh all the children in their catchment area and still have time for their other curative and preventive activities. Communities should be motivated to do most of the weighing themselves.

Implementation of growth monitoring at community level will have to take into account the fact that routine repeated visits at regular intervals are the essence of GMP. This imposes a great demand on both mothers' and health workers' time. Resources will be required for equipment and materials as well as for training, supervision and logistic support.

Where GMP and nutritional surveillance occur concurrently in programmes as they do in Vihiga Division, the purpose/structure and function of each must be clearly defined to ensure their precise applications at the local level. To help make sure that GMP services focus attention on the most needy families, the health centre based nutritional surveillance system will have to be incorporated into more effective community based food and nutrition surveillance systems that have better and timely mechanisms for feedback and action.

F. RECOMMENDATIONS

The question of whether GMP can be done definitely through regular health services even when resources are adequate for assessment and action is yet to be resolved. If resources for action are not readily available GMP is tantamount to measurement alone and this is a waste of time and effort.

In view of the findings, the following recommendations can be made on:

1. Infrastructure

The main areas of infrastructure that need attention include:

. Renovations and repairs of Vihiga and Lianaginga health centres.

. Maintenance and repair of existing toilet facilities and improvement of water supply.

. Provision of adequate supply of growth charts and surveillance recording forms.

. Repair and maintenance of broken down scales.

. Provision of appropriate weighing scales in kilograms and if available with a damped scale motion.

. Provision of suspension mechanism for the present salter dial weighing scales.

2. Nutrition Surveillance

. The present health facility based nutrition surveillance needs to be incorporated into ongoing community based food and nutrition surveillance systems.

. Additional data on growth treads need to be collected.

. For purposes of comparison nutrition status should be determined using Z scores rather than the present percentile system.

3. Training

Considerations should be given to training all the relevant personnel at each health facility. Emphasis in training should be on :

. Clear and definite interventions.

. Communication and counseling skills.

. Proper filling in of the child health cards.

. Management and use of growth monitoring data.

4. Coverage/Community participation

Despite the long walking distances, by the age of 3 months, the majority of the children had been weighed at least once at their nearest health centre.But after immunizations are finished, the majority of the children attend the health facility only
for treatment. To improve programme coverage and community participation, efforts should be made to:

. minimize the time the mothers wait and decrease confusion during the weighing sessions by implementing proper patient flow mechanisms at each health facility.

. involve and educate the community especially the mothers on the importance of the growth chart and also on the relationship between nutrition and general child health.

. strengthen outreach activities and follow-up and referral systems.

5. Areas of Research

There is an urgent need for operations research in two main areas :

. Find ways in which effective linkages between the health worker and the community can be achieved through proper training in growth monitoring procedures.

. Develop the appropriate community based interventions which should be implemented when the screening prcedures identify growth faltering.

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APPENDICES

APPENDIX B

THE COMPLEMENTARITY BETWEEN GROWTH MONITORING AND NUTRITION SURVEILLANCE

FACTOR/ROLE	GROWTH MONITORING	NUTRITION SURVEILLANCE
STRATEGY	Presentation & preparation of optimal Physical growth & development	Detection of undernutrition
APPROACH	Educational - motivational, especially at family level	Diagnostic-interventional, especially at community and higher organizational levels
ENROLLMENT	All infants & toddlers & pre-school children were possible	Representative samples
AGE	At birth through 3 years as a minimum	At representative ages
NUMBER	Small groups of 10-20	Any suitable size e.g. 50-100
WEIGHER OR RECORDER	Family e.g. mother h/worker or other health related personnel	Trained h/workers or other related health workers
DOCUMENTS/ CARDS	Simple, emphasises growth	Precise, emphasises nutritional status
NUTRITIONAL EMPHASIS	Maintaining good nutrition	Detect malnutrition
RESPONSE	Early home intervention based on local knowledge	Nutritional rehabilitation including supplements
RESPONSE TIME	Brief resumption of normal growth	Long regain of good nutrition in the community
INTERVENTION	Integrated child survival & development oriented, PHC approach - ORT, immunization, Family planning, treatment.	Food supplements or community wide response
REFERRAL	Health systems for check up and possible treatment including therapeutic supplements	Malnutritional rehabilitation often in special centres

Source : Workshop on Nutrition surveys and surveillance in the African Region, Brazzaville, 19-29 April, AFR/NUT/101 (1988).

APPENDIX A

EXPECTED WEIGHT GAIN OF INFANTS AND YOUNG CHILDREN

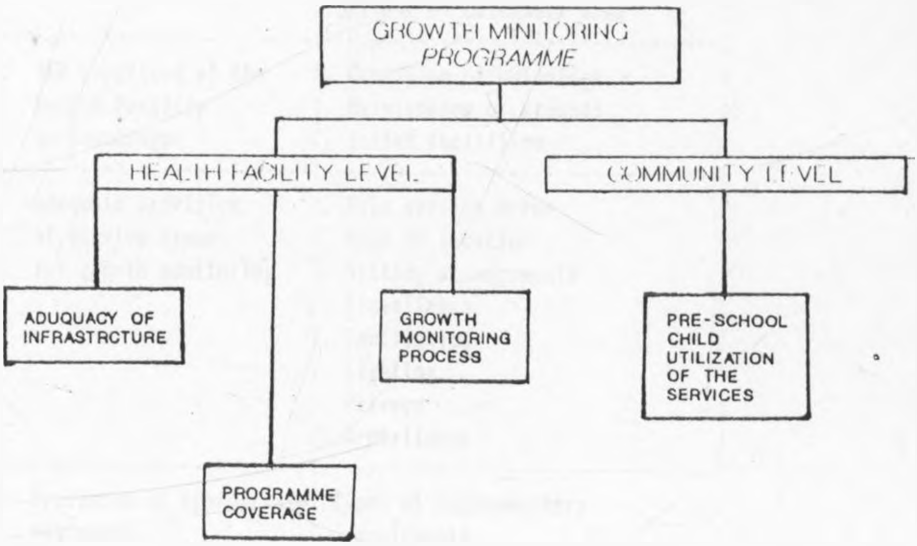
(According to NCHS reference values)

Expected gain per month			Expected gain in 3 months		
Age (months)	Median	Median -2 SD	Median	Median 2 SD	Minimum
0-3	0.9	0.6	2.7	1.7	1.7
3-6	0.6	0.6	1.8	1.8	1.7
6-9	0.5	0.4	1.4	1.3	1.3
9-12	0.3	0.3	1.0	0.9	0.9
12-15	0.2	0.2	0.7	0.6	0.6
15-18	0.2	0.1	0.6	0.4	0.4
18-21	0.2	0.1	0.5	0.4	0.4
21-24	0.2	0.1	0.6	0.4	0.4
24-27	0.2	0.1	0.5	0.4	0.4
27-30	0.2	0.1	0.6	0.5	0.4
30-33	0.2	0.1	0.5	0.5	0.4
33-36	0.2	0.1	0.5	0.4	0.4

Source : Workshop on Nutrition surveys and surveillance in the African Region, Brazzaville 19-29 April, AFR/NUT/101 (1988).

APPENDIX C

THE CONCEPTUAL FRAME WORK OF THE STUDY DESIGN



APPENDIX D

INDICATORS USED TO EVALUATE THE GROWTH MONITORING AND PROMOTION PROGRAMME

D.1 ADEQUACY OF CHILD GROWTH MONITORING FACILITIES EQUIPMENT AND MATERIALS

Indicator	Definitions
1. Physical availability of growth monitoring structures	. Types and numbers available . Location . Services offered . Extent of catchment area
2. The condition of the Health Facility surroundings	. Condition of buildings . Maintenance of grounds . Toilet facilities
3. Adequate provision of service areas for growth monitoring	. Main service areas . Type of location . Sitting arrangements . Cleanliness . Ventilation . Lighting . Privacy . Orderliness
4. Provision of Appropriate equipment	.Types of supplementary equipments .No./quantities available .Frequency of use .Condition of the equipment
	.Number and types of scales available .Condition and calibration of the scales .Accuracy and positioning of the scales
5. Supplies of enough educational materials and data recording forms.	.Types of supplies available .Quantities available .Frequency of use .Condition of supplies

D : 2 AVAILABILITY OF SKILLED PERSONNEL

Personnel training	. Number trained . Length and type of training . Extent of deployment in Growth Monitoring
	.Opinion on Growth Monitoring .Use of Growth Monitoring data .Method of dealing with 'at risk' children
Personnel competence in enrollment procedures	.Correct registration procedures
	.Correct filling in of child health card information
Personnel competence in weighing procedures	.Correct preparation of the child before taking weight measurement .Correct reading and recording of the weight measurement .Correct classification of child's nutritional status .Encouragement of mother's participation .Relevant comments on the child's weight .Time taken to weigh the child
	. Accuracy of the weight measurements
Personnel competence in counseling	. Relevant reasons for counseling . Good use of information from the child health card . Attempts made to elicit background information . Type and relevance of advice given to the mother . Attempts made to involve the mother . Length of time taken

D.3 AVAILABILITY OF GROWTH MONITORING RECORDS

Indicator	Definitions
1. Appropriate use and maintenance of Growth Monitoring records	. Proper maintenance and correct use of the following records : . Follow-up register . Tally sheets . Summary sheets . Practical use of available data
2. Availability of complete data on targets recruited into the programme	. The type of records kept on all targets reached.
3. Availability of complete data on children at risk and needing follow-up	. The type of records kept on all at risk children identified by the programme.
4. Implementation of target recruitment procedures	. Out-reach-activities . Organization of lines - of patient for the clients. . Referral procedures . Follow-up procedures

D : 4 HOUSEHOLD/FAMILY CHARACTERISTICS

Indicator	Definitions
Maternal characteristics	. Social cultural background
	. Ability to intepret the growth curve
	. Level of satisfaction with the health centre
Household characteristics	. Household composition . Access to community services . Sanitary & economic environment
Pre-school child characteristics	. Health status . Nutrition status . Health centre utilization

APPENDIX E

HEALTH FACILITY INFRASTRUCTURE

H.F. Name .....

NUTRITION SURVEILLANCE AND GROWTH MONITORING PROGRAM

KAKAMEGA DISTRICT - VIHIGA DIVISION

IDENTIFICATION

Date of Interview	Inter-viewer	Name of Respondent & Title	Code	Name of Health Facility	Code
2-9	10		11		12

Col 10	Col 11	Col 12
1 =Self	1 =The I/C	1. Sabatia
2 =Assistant	2 =CO	2. Mbale
	3 =Doctor	3. Lianaginga
	4 =Nurse	4. Vihiga
	5 =Nutritionist	
	6 =PHO	

OBSERVATIONS:

H.F. Name .....

A. FACILITIES

Record Type | 1 |

1. TYPE AND LOCATION OF FACILITIES

Facility Type	Code	Year when built	Code	Total No. of buildings
	13		14-15	16

Col 13
1 =R.H.T.C.
2 =Health Centre
3 =Dispensary
4 =Private Clinic
5=

Col 14
Age of H.F. in years

Source of Funding	Location: Distance of Health F. from Tarmac road	School	Market	Admin. post	Types of services offered at the H.F.: MCH/FP	Curative	Other Specify	Code
17	18	19	20	21	22	23		24

Col 17
1=Private
2=Govt.
3=Missionary
4=All three
5=

Col 18-21
1=5-30 mins. walk
2=Less than an hours walk
3=More than an hours walk

Col 22/23
Y=Yes
N=No

Col 24
1=
2=
3=
4=

2. EXTENT OF CATCHMENT AREA

Catchment Area		Service Records for:	
Sub-location	Population	Most immediate cause of Health service use	Numbers affected

OBSERVATIONS

H.F. Name .....

Record Type | 2 |

3. CONDITION OF SURROUNDINGS

Condition of the building	Type of	
	Walls	Roof
13	14	15

Col 13	Col 14	Col 15
1=Cracked walls	1=Stone	1=Iron sheets
2=Broken windows	2=Brick	2=Tiles
3=Broken doors	3=Bud	3=Grass
4=Leaking roof		
5=All four		
6=In good repair		

Maintenance of the grounds			Toilet facilities		
Litter	Grass	Drainge	Types	Number	Cleanliness
16	17	18	19	20	21

Col 16	Col 17	Col 18
1=Every where	1=V. long	1=Water pools present
2=All put in dust bins	2=Short	2=Water pools absent
3=All put in a pit		
4=Put in both		

Col 19	Col 21
1=Pit	1=Clean
2=Western	2=Bloked
3=Both	3=Smelly
4=None available	4=Never cleaned

H.F. Name .....

Record Type | 3 |

4. SERVICE AREAS

Service Area	Code	Location	Assessment of service area for: Seating Arrangements: Comfort	Seating Arrangements: Availability	Cleanliness	Neatness	Ventilation
	13	14	15	16	17	18	19
Registration	1						
Weighing	2						
Counseling	3						
Treatment	4						
Immunization	5						

Col 14	Col 15	Col 16	Col 17
1=Inside	1=V. Comfort.	1=For all pts.	1=Clean every day
2=Outside (shaded)	2=Comfort.	2=For few of the pts.	2= " occasionally
3=Outside (open)	3=Uncomfort.	3=Not available	3=Never cleaned

Col 18	Col 19
1=V. Neat	1=Good
2=Neat	2=No windows
3=Untidy	3=Windows too small

OBSERVATIONS

H.F. Name .....

Service Area	Code	Assessment of service area for: Lighting	Quietness	Privacy	Orderliness	Signs and Directions
	13	20	21	22	23	24
Registration	1					
Weighing	2					
Counselling	3					
Treatment	4					
Immunization	5					

Col 20	Col 21	Col 22	Col 23	Col 24
1=Good	1=V. Quiet	1=V. Private	1=V. Orderly	1=V. Clear
2=Poor	2=Quiet	2=Private	2=Orderly	2=Clear
3=No Natural	3=Noisy	3=No privacy	3=Chaotic	3=Not clear
4=Only *				4=Absent

OBSERVATIONS

H.F. Name .....

B. EQUIPMENT

Record Type 4

1. SUPPLEMENTARY EQUIPMENT

	Code	Available	Number	Enough quantities	Frequency of use	Condition
	13-14	15	16-17	18	19	20
Hand basin	01					
Soap dish	02					
Waste paper basket	03					
Cabinet	04					
Table	05					
Calculator	06					
Scales	07					
Chair	08					
Demonstration kit	09					
Cooker (Gas, Makaa)	10					

Col 15	Col 18	Col 19	Col 20
Y=Yes	Y=Yes	1= Used all the time	1=Functioning
N=No	N=No	2= Occasionally used	2=Broken down
		3= Never used	

OBSERVATIONS

H.F. Name .....

Record Type | 5 |

2. WEIGHING SCALES

Number of scales in use	Frequency of checking the scales	Method used for checking the scales
13	14	15

Col 14
1=Once a month
2=Once a day
3=Once a week
4=Never checked
5=Occasionally

Col 15
1=Use a known weight
2=
3=

Scale Serial No	Type of scale	Type of Measurement	Condition of the scale	Calibration of the scale
16-17	18	19	20	21
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Col 18
1=Salter + pants
2=Baby scale
3=Bathroom scale
4=Balance baby scale

Col 19
1=Lbs. Ozs
2=Kgs. Gms

Col 20
1=Functioning
2=Broken down

Col 21
1=At zero
2=Not at zero

H.F. Name .....

Serial No.	Accuracy of the scale: Known Wt.	Accuracy of the scale: Scale Reading	Code	Maximum Wt.	Positioning of the scale	Code
16-17	22-25	26-29	30	31-34		35
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

Col 30	Col 35
1=Accurate	1=Hung up securely at the right height
2=Not accurate	2=Firmly on the table
	3=Very insecure

OBSERVATIONS

H.F.Name .....

C. MATERIALS

Record Type | 6 |

1. SUPPLEMENTARY SUPPLIES AND EDUCATIONAL MATERIALS

	Code	Available	Enough quantities	Frequency of use	Condition
	13	14	15	16	17
How to use the Child Health Card booklet	1				
Improving young child growth	2				
CHANIS: A guide for health workers in Kenya	3				
Dried Skimm Milk (DSM)	4				
Child Health Cards	5				
CHANIS forms	6				
Visual aids	7				
Follow-up booklet forms	8				

Col. 14	Col.15	Col. 16	Col. 17
1=Not yet ordered	Y=Yes	1=Used all the time	1=V.good
2=Not available	N=No	2=Occasionally used	2=Good
3=Yes		3=Never used	3=Torn
4=Has never been used			4=Dirty

OBSERVATIONS

APPENDIX F

PERFORMANCE OF CHILD GROWTH MONITORING PROCEDURES

H.F. Name .....

Record Type | 12 |

1. ORGANIZATION OF PATIENTS LINES OF FLOW

WAITING AREA	SERVICE AREA

H.F. Name .....

2. REGISTRATION PROCEDURES

Record Type |12|

a. The new patient register

Health Cadre Name .....Qualification .....

Health Cadre Serial No. |__|__|
13 14

First visit recording	Code	Lost cards recording	Code	Outside cards recording	Code
	15		16		17

Re-attendance recording	Code	Summation for each month	Code
	19		20

Col 15-20
1=Correctly done
2=Wrongly done
3=Not done

H.F. Name .....

b. The child health card

Health Cadre Name .....Qualifications .....

Health Cadre Serial No. |__|__|
13 14

Part of the card filled	PART A	Determining the age of the child	Code	PART B	PART C	PART D
15	16		17	18	19	20

Col 15
1=All the four parts
2=Only three parts
3=Only two parts
4=Only one part

Col 16,18-20
1=Not filled
2=Filled and accurate
3=Filled and inaccurate
4=Incomplete
5=N/A

Col 17
1=Birth certificate
2=Local events calendar
3=Church baptism card
4=Guessing

NOTE:

FRONT SIDE		INNER SIDE	
PART A	PART B	PART C	PART D
Identification Information	Immunization Information	Name and Birth Wt.	Reasons for Special care

OBSERVATIONS:

H.F. Name .....

3. HEALTH CADRES SKILL IN WEIGHING

Record Type |14|

Health Cadre Name .....Qualification .....

Health Cadre Serial No. |__|__|
13 14

[Randomly choose five children for each health worker] and observe the task of weighing for each child

Serial No.	Child's No. Start time	Scale at zero	Child's clothing	Code	Before Reading the Weight: The Child is free	The Child is quiet	Needle is at rest	The scale is steady
15		16		17	18	19	20	21
1								
2								
3								
4								
5								

Col 16,19-21
Y=Yes
N=No

Col 17
1=No clothing
2=Minimum clothing
3=Has all clothing
4=Has all clothing minus napkin

Col 18
Y=Yes
2=Child held on the scale
3=Child's feet not off the ground

H.F. Name .....

	Correct reading of the weight measurement		Code	Recording of Weight Measurement		
	H. C. reading	Interviewers reading		Correct current month	Correct age box	Correct plotting
No.	22-25	26-29	30	31	32	33
1						
2						
3						
4						
5						

Col 30
1=Agree
2=H.C. margin of error more than 100 gms.
3=H.C. margin of error less than 100 grms.

Col 31-33
1=Yes
2=No

	The Child's Nutritional Status			
	Growth Velocity	Code	Classification	Code
No.		34		35
1				
2				
3				
4				
5				

Col 34

Normal Weight	Under Weight
1.Gaining	4.Gaining
2.Static	5.Static
3.Loosing	6.Loosing

Col 35
1.Wrongly classified
2.Correctly classified

H.F. Name .....

No.	Mothers' participation	Code	H.C. Comments on the child's		Finish time	Total time
			Weight	Attendance		
		36	37	38		39-40
1						
2						
3						
4						
5						

Col 37
1=Minimal
2=Passive
3=Active

Col. 38-39
Y=Yes
N=No

Total No. of children	Total time	Average Time/Child (mins) 41-42

HEALTH CADRES WEIGHT MEASUREMENT

Known weight	Hlth cadres wt record	Comments on accuracy of measurement
_____		
	1. _____	
	2. _____	
	3. _____	
Acceptable limits are	Average _____	
± 100 gms.		

H.F. Name .....

No.	Mothers' participation	Code	H.C. Comments on the child's		Finish time	Total time
			Weight	Attendance		
		36	37	38		39-40
1						
2						
3						
4						
5						

Col 37
1=Minimal
2=Passive
3=Active

Col. 38-39
Y=Yes
N=No

Total No. of children	Total time	Average Time/Child (mins) 41-42

HEALTH CADRES WEIGHT MEASUREMENT

Known weight	Hlth cadres wt record	Comments on accuracy of measurement
_____		
	1. _____	
	2. _____	
	3. _____	
Acceptable limits are		
	Average _____	
± 100 gms.		

4. ACCURACY OF THE WEIGHT MEASUREMENT

Record Type |15|

H.F. Name .....|__|
13

[Verify using children already weighed]

Child's No.	Child's Age	Weight plotted on the card	Interviewers' weight record	Are weight measurements in agreement	Is Recording of weight measurement correct?
14-15	16-17	18-21	22-25	26	27
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Col 26
1. Same wt. record
2. Card wt. above 100 grms.
3. Card wt. below 100 grms.

Col 27
1. Yes
2. No.

H.F. Name .....

5. MEANS OF NUTRITION COUNSELLING

Record Type |16|

Health Cadre Name .....Qualifications .....

Health Cadre Serial No. |__|__|
13 14

(Randomly choose five children for each health worker and observe the task of counselling for each child)

Serial No.	Start time	Nutrition/Hlth Reasons for counselling	Code	H. C. Looks at the card	Age of the child	Code
15			16	17	18-19	20
1						
2						
3						
4						
5						

Col 16
1=Child sick
2=child not gaining wt.
3=child loosing weight
4=child having good weight gain

Col 20
1=Age asked
2=Age not asked

Col. 17
1= Yes
2= No

H.F. Name .....

No.	N. status of the child	Code	Health cadres comments on child's weight	Code	Health cadre comments on child's health	Code
1		21		22		23
2						
3						
4						
5						

Col 21
1= NW/G
2= NW/L
3= NW/S
4= UW/G
5= UW/L
6= UW/S

Col 22
1=Yes
2=No

Col 23
1= Yes
2= No
3=

No.	Is any attempt made to determine the : Socio/ economic situation of the child	Sanitary environment of the child	Are the Comments made by the Health cadre on foods to be fed to the child relevant (Brief description)	Code
	24	25		26
1				
2				
3				
4				
5				

Col. 24-25
Y= Yes
N= No

Col 36
1=No comment
2=Give foods high in energy
3=Prepare easy to digrest foods
4=Prepare foods free from germs
5=Irrelevant comments made
6=Other

H.F. Name .....

No.	N. status of the child	Code	Health cadres comments on child's weight	Code	Health cadre comments on child's health	Code
1		21		22		23
2						
3						
4						
5						

Col 21
1= NW/G
2= NW/L
3= NW/S
4= UW/G
5= UW/L
6= UW/S

Col 22
1=Yes
2=No

Col 23
1= Yes
2= No
3=

No.	Is any attempt made to determine the : Socio/ economic situation of the child	Sanitary environment of the child	Are the Comments made by the Health cadre on foods to be fed to the child relevant (Brief description)	Code
	24	25		26
1				
2				
3				
4				
5				

Col. 24-25
Y= Yes
N= No

Col 36
1=No comment
2=Give foods high in energy
3=Prepare easy to digrest foods
4=Prepare foods free from germs
5=Irrelevant comments made
6=Other

H.F. Name .....

	The Health Cadre gives advice/information on					
	Frequency of feeding	Breast feeding	Mothers diet	Immunizations	Regular weighing	Col 27-31 1=Yes 2=No
No.	27	28	29	30	31	
1						
2						
3						
4						
5						

	Gives client a chance to ask questions	Thanks/Congratulates mother	Finish time	Total time	
No.	32	33		34-35	Col 32-35 N= No Y=Yes
1					
2					
3					
4					
5					

Total No. of children	Total time	Average time per child
		36-37

APPENDIX G

GROWTH MONITORING RECORDS

H.F. Name.....

Record Type | 7 |

1. Follow-up Register

No. in use	Condition of the register	Code	Summation per month	At risk children	Frequency of checking the register	Code
13		14	15	16		17

Col. 14	Col. 15-16	Col. 17
1=V.good	1=Clearly shown	1=
2=Good	2=Not clear	2=
3=Torn	3=Not shown	3=
4=Dirty		4=

Note book for additional information	The follow-up register has been used to: Show areas most hit by malnutrition	Identify main: Medical problems	Identify main: Nutritional problems	Plan home visits	Record of home visits is kept	Total No. of home visits since the Program began
18	19	20	21	22	23	24-26

Col. 18	Col. 19-23
1=Is kept	Y=Yes
2=Is not kept	N=No

Constraints to home visiting	Code
	27-28

Col. 27-28
1=No Transport
2=
3=
4=

H.F. Name .....

2. Tally Sheets (CHANIS - 1):

Correct Age categories used on the		Weighing and Tallying is done		Tallying Procedure	Code	Additions on the Tally sheet
Tally Sheet	C. H. Card	By one person	In one place		33	34
29	30	31	32			

Col 29-30
Y=Yes
N=No

Col 33
1=
2=
3=

Col 34
1=Correct
2=Not filled
3=Incorrect
4=Incomplete

3. Summary sheets for the month (CHANIS - 3)

Are the forms			Figures filled in items 1-11	Type of error check done	Code
Filed	Readily available	Well kept			
35	36	37	38		39

Col 35-37
Y=Yes
N=No

Col 38
See Col 79

Col 39
1=
2=
3=

4. Summary sheets for six months (CHANIS - 4)

Data for the current month	Are the forms			Copying of figures for items 1-9	Calculated values for items 10-13
	Filled	Readily available	Well kept		
40	41	42	43	44	45

Col. 40
1=Complete
2=Incomplete
3=Not available

Col. 41-43
N=No
Y=Yes

Col. 44-45
1=Correct
2=Wrong
3=Not done

2. What steps have been taken to involve the community. (Brief description)

3. What steps have been taken to deal with the mothers who bring children only for immunizations and/or weighing? (Brief description)

H.F. Name .....

5. Appropriate use of GM data

1. Has the data from CHANIS forms been used to show:

   a) Magnitude and trend of the N.S. of children attending the Health Facility?

   ---

   b) Impact of the N.S. GMP?

   ---

   c) Facility workload level and trend?

H.F. Name .....

6. Health facility child growth monitoring figures

Record Type | 8 |

Month	Year	Code	Normal Weight	Under Weight	Totals
		A			
		B			
		C			
		T			
		A			
		B			
		C			
		T			
		A			
		B			
		C			
		T			
		A			
		B			
		C			
		T			

A=0-11 months B=11-35 months C=35-59 months T= Totals

H.F. Name ....

7. Foloww up figures for children 'at risk'

Record Type | 9 |

Month	Year	Children needing follow-up		Child attendance at the H.F.		
		At risk	Total Recorded	New	Re-Attendance	Totals

H.F. Name .....

BRIEF DESCRIPTIONS OF :

8. Out-Reach Activities:

9. Follow-up system

10. Referral system

H.F. Name .....

BRIEF DESCRIPTIONS OF :

8. Out-Reach Activities:

9. Follow-up system

10. Referral system

APPENDIX H

GROWTH MONITORING PERSONNEL

H.F. Name.....

Record Type |10|

IDENTIFICATION								
Date of interview	Inter-viewer	Name of Resp.	Code	Nearest cluster	H.F.	Sub-Location name	Code	
13-20	21		22	23	24	25		26 27

Col 21	Col 22		Col 25
1=Self	1=The I/C	4=Nutrit.	1=Lianaginga
2=Assistant	2=CO.	5=PHO	2=Mbale
	3=Nurse	6=Other	3=Vihiga
			4=Sabatia

OBSERVATIONS

H. F. Name .....

Record Type | 10 |

1. TRAINING

Serial No.	Name and title of the Health provider	Code	Has been trained in G.M.	How long was the training (weeks?)	Code	Where did the training take place	Code
28-29		30-31	32		33-34		35
01							
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							

Col 30-31		Col 32	Col 35
1=CO	10=PHT	Y=Yes	1=At the H.F
2=ECN	11=NFW	N=No	2=At the workshop
3=FHFE	12=CNT		
4=SC	13=PHN		
5=SS	14=EN		
6=PHO	15=EM		

H.F. Name .....

Record type | 10 |

Serial No.	Who provided the training	Code	At present provides G.M. services	Present area of work in G.M. program	Code	Time spent at area of work	Code
28-29		36	37		38		39

Col.36
1=DIT
2=Trained colleague
3=Trained officer I/C

Col.37
Y=Yes
N=No

Col.38
A=Registration
B=Weighing
C=Tallying
D=Counselling
E=Compiling data
F=Treating
G=Follow-up

Col.39
1=Daily
2=Weekly
3=Occasional

H.F. Name .....

Record Type |11|

2. KNOWLEDGE ON USE OF GROWTH MONITORING INFORMATION

Health Cadre Name .....Qualifications .....

Health Cadre Serial No. |__|__|
13 14

What is your opinion on the reference materials used in the GMP	Code 15	What kind of feedback do you expect to receive on the data that you collect and send to headquarters	Code 16

What is your main reason for collectting this data	Code 17	How do you use the information that you collect	Code 18

How do you deal with a child who is at nutritional risk?	Code 19	Reasons for the answer given	Code 20

APPENDIX I

COMMUNITY SURVEY

NUTRITIONAL SURVEILLANCE AND GROWTH MONITORING PROGRAMME

KAKAMEGA DISTRICT

VIHIGA DIVISION

Form No.

IDENTIFICATION

Location ..... | | (1) sub-Location ..... | | | (2 3)

Cluster No.	H/Hold No.	Form No.	Date of Survey	Inter-viewer
4-5	6-7	8-10	11-18	19

Respondent ..... Status ..... | | (20)

Col 19
1. Self
2. Assistant
3. Both

Col 20
1. Parent
2. Older child
3. Employer
4. Relative

Record Type | 1 |

I. MEMBERS OF THE HOUSE HOLD

Form No. _____

4	6	7	2				2	4	7	2
Name	Serial No.	Relation to Head of the Family	Code	AGE			Sex	Number of days sick past week	Type of illness	Code
				Date of birth 4	Years 5	Month 5				
	21-22		23		24-25	26-27	28	29		30

Col 23
1. Head man
2. Head woman
3. Wife
4. Child
5. Parent
6. Visitor
7. Grand child
8. Daughter-in-law
9. Other

Col 28
1. Male
2. Female

Col 30
1. Well
2. Scabies
3. Coughing
4. D/Vomiting
5. Hot/Fever
6. Runny Nose
7. Ear Ache
8. Breathing Problems
9. Other

Form No.

II. INFORMATION ON THE CHILD

Study Child's Serial No. |__|__| (21 22) Name .....

(From RTI)

The Child is (24)	Place of Birth (25)	Consultation during pregnancy (26)	Who usually takes child to the HF (27)

Col 24	Col 25	Col 26	Col 27
1. Alone	1. Home	1. Trad. birth	1. Mother
2. Twin	2. Hospital	2. Clinic	2. Father
3. Triplet	3. Health Centre	3. Both	3. G.Parent
4. Orphan	4. Other	4. No cons.	4. Other

When was the most recent visit (months) (28)	What was the reason for the visit (29)	Which HF was used (30)	Who took the child (31)

Col 28	Col 29	Col 30	Col 31
1. During the month	1. Attend clinic	1. Vihiga	1. Mother
2. 1-3 months	2. Child sick	2. Sabatia	2. Father
3. 4-6 "	3. Check-up	3. Lianaginga	3. G. Parent
4. 7-9 "	4. 1 and 2	4. Mbale	4. No Record
5. 10-12 "	5. No Record	5. Private Clinic	
6. Over 1 year		6. Miss Hospital	
7. No Record		7. Outside Study Area	
		8. No Record	

Form No.

Distance to the HF (Time)		Transport used	Cost of Travel (Shs.)		Type of Health Care Received	Cost of Treatment In (Shs.)	
32	Code	33	34	Code	35	36	Code

Col 32	Col 33	Col 34	Col 35
1. Upto 30 mins	1. Public	1. No Public Transport	1. Immunization
2. 30-60 mins	2. Own	2. 1-5 Shs.	2. Weighing
3. Over 60 mins	3. Walking	3. 6-10 Shs.	3. 1 and 2
	4. Cycling	4. 10-20 Shs.	4. Check-up
	5. 3 and 1	5. More than 20 Shs.	5. Treatment
	6. No Record		6. 2 and 5
			7. 1, 2 and 5
			8. No Record

Check for BCG Scar	Measles	Take Child's Anthropometric Measurements		Child's NS Using The New CH Card
		WEIGHT	LENGTH	
37	38	39-42	43-47	48

Col 37	Col 38	Col 48
1. Present	1. Suffered	1. Normal
2. Absent	2. Not suffered	2. Underweight

Form No.

III. CHILD'S CLINIC ATTENDANCE

Has the Child ever had a Child H/C.	What type of Document does the Child have now	Condition of the Document: Cleanliness	Condition of the Document: Legibility	Source of the Document
49	50	51	52	53

Col. 49	Col 50	Col 51,52	Col 53
1. No Card	1. Has no Doc.	1. Good	1. Nearest HF
2. Has a Card	2. New CH Card	2. Fair	2. Other HF within Study Area
3. Card lost	3. Old CH Card	3. Poor	3. Mission Hosp.
4. Card is unavailable	4. Outpnt Card	4. N/A	4. Outside Study Area
	5. Birth Note paper		5. No Record
	6. Other		6. Chief's Office

Check the Card for:				
Filling of the CH Card			Plotting of wts/on the CH Card	Child's Clinic Attendance
Sibling Inform	Name and Birth wt Inf.	Special Care Inf.		
54	55	56	57	58

Col 54,55 & 56	Col. 57	Col 58
1. Filled	1. Not Plotted	1. Regular(if schedule is kept)
2. Incomplete	2. Correct	2. Irregular (if schedule not kept)
3. Not filled	3. Wrong	3. Non Attended
4. N/A	4. N/A	4. No Record
		5. N/A
		6. Only one visit
		7. One visit app. not due

Form No.

Return Visit Appointment	Code	What are the reasons for not keeping the Appointment	Code
	59		60

Col 59
1. Not yet due
2. Not given
3. Given and kept
4. Given and not kept
5. No Record
6. Kept but no service provided at the HF

Col 60
1. Not aware of the appoitment
2. Thought Immunization were finished
3. Mother was sick
4. Child was sick
5. Went on Safari

OBSERVATIONS:

Form No.

Study Child's Serial No. |__|__| (21 22) Name .....

IV. GROWTH MONITORING INFORMATION

OFFICIAL USE			Briefly Describe Type of Documents	Code
The Study of Child's		Age of the Child at start of programme		27
Date of Birth	Age(months)			
	23-24	25-26		

FORM NO.

Serial No.	Age in Months	GROWTH MONITORING			Immuni-zations	Treat-ment (Tick)	Utiliza-tion Pattern
		wt Record	Nut. Status	Pattern			
28-29	30-31	32-35	36	37	38	39	40

Col 36	Col 37	Col 38	Col 39	Col 40
1. Normal wt.	1. Gaining	1. BCG	1. Yes	1. Only weighed
2. Under wt.	2. Static	2. DPT	2. No	2. Only Immuni-zation .eated
3. Border	3. Loosing	3. Polio	3. D/Vomit	3. Only treated
	4. N/A	4. Measles	4. Malaria	4. All three
			5. Pneumonia	
			6. Scabies	

Form No.

V. INFORMATION ON THE CHILD'S MOTHER

Mother's Serial No. |__|__| (21 22) Name .....

Child's Parents			
If Alive	Present Residence	Ethinicity	Religion
23	24	25	26

Col 23	Col 24	Col 25	Col 26
1.Both Alive	1. Both Present	1. Maragoli	1.P.A.G.
2.Mother Dead	2. Father Absent	2. Tiriki	2.Catholic
3.Father Dead	3. Mother Absent	3. Munyore	3.Muslim
4.Both Dead	4. Both Absent	4. Isukha	4.H. Spirit
		5. Other	5.A.D. Church
			6.Friends
			7.Other

Education						
Type	No. of Years	Employment	Present Econ. Activity	Marital Status	Total No. of Live Births	Total No. of Children alive
27	28	29	30	31	32-33	34-35

Col 27	Col 29	Col 30	Col 31
1. No Education	1. No Employment	1. Cash crop	1. Married
2. Adult Class	2. Self "	2. Food crop	2. Single
3. Primary	3. Wage Earner	3. Both 1 and 2	3. Widow
4. Secondary	4. Casual Lab.	4. Trading	4. Separated
5. Beyond Sec.	5. Retired	5. Service	5. Divorced
		6. No Activity	

Form No.

V. INFORMATION ON THE CHILD'S MOTHER

Mother's Serial No. |__|__| (21 22) Name .....

Child's Parents			
If Alive	Present Residence	Ethinicity	Religion
23	24	25	26

Col 23	Col 24	Col 25	Col 26
1.Both Alive	1. Both Present	1. Maragoli	1.P.A.G.
2.Mother Dead	2. Father Absent	2. Tiriki	2.Catholic
3.Father Dead	3. Mother Absent	3. Munyore	3.Muslim
4.Both Dead	4. Both Absent	4. Isukha	4.H. Spirit
		5. Other	5.A.D. Church
			6.Friends
			7.Other

Education		Employ-ment	Present Econ. Activity	Marital Status	Total No. of Live Births	Total No. of Children alive
Type	No. of Years					
27	28	29	30	31	32-33	34-35

Col 27	Col 29	Col 30	Col 31
1. No Education	1. No Employment	1. Cash crop	1. Married
2. Adult Class	2. Self "	2. Food crop	2. Single
3. Primary	3. Wage Earner	3. Both 1 and 2	3. Widow
4. Secondary	4. Casual Lab.	4. Trading	4. Separated
5. Beyond Sec.	5. Retired	5. Service	5. Divorced
		6. No Activity	

FORM NO

Is the Child's Mother		
Pregnant	Breast-feeding	A Women's Group Member
36	37	38

Col 36-38

1. Yes
2. No
3. N/K

Mother's satisfaction with the Nearest Health Facility:

Nearest Health Facility .....(Name) ___ 39

Working Hours	Code	Drugs	Code	Personnel Behaviour	Code	Waiting Time	Code	Location	Code
	40		41		42		43		44

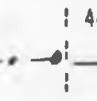
Advice and Information on:					
Weaning of Children	Code	Breast-feeding	Code	Weighing	Code
	45		46		47

Col 40-47

1. Very Satisfied
2. Satisfied
3. Not Satisfied
4. No Comment

Mothers Interpretation of the Growth Curve:

Show her three weight Patterns.

Weight Gain	Code	No wt Gain	Code	Loss of Weight	Code
	47		48		49

Col 47-49

1. Correct Interp.
2. Wrong Interp.
3. No attempt made

Form No.

VI. HOUSEHOLD ACCESS TO SERVICES

Major Water Source			
Type used	Protection	Availability	Distance (Time)
21	22	23	24

Col 21	Col. 22	Col 23	Col. 24
1. Spring	1. Yes	1. Throughout	1. Upto 30 mins
2. Well	2. No	2. Seasonal	2. 30-60 mins
3. River			3. Over 60 mins
4. Tap			
5. Rain			

Sanitation		Fuel		
Faeces Disposal	Refuse Disposal	Type used	Source	Cost Shs.
25	26	27	28	29-30

Col 25	Col 26	Col 27	Col 28
1. Toilet	1. Pit	1. Firewood	1. Own
2. Latrine	2. No Pit	2. Charcoal	2. Bought
3. None Available	3. Other	3. Both	3. Bush
		4. Other	4. All three

Form No.

Type of Housing		
Floor	Roofing	Walls
31	32	33

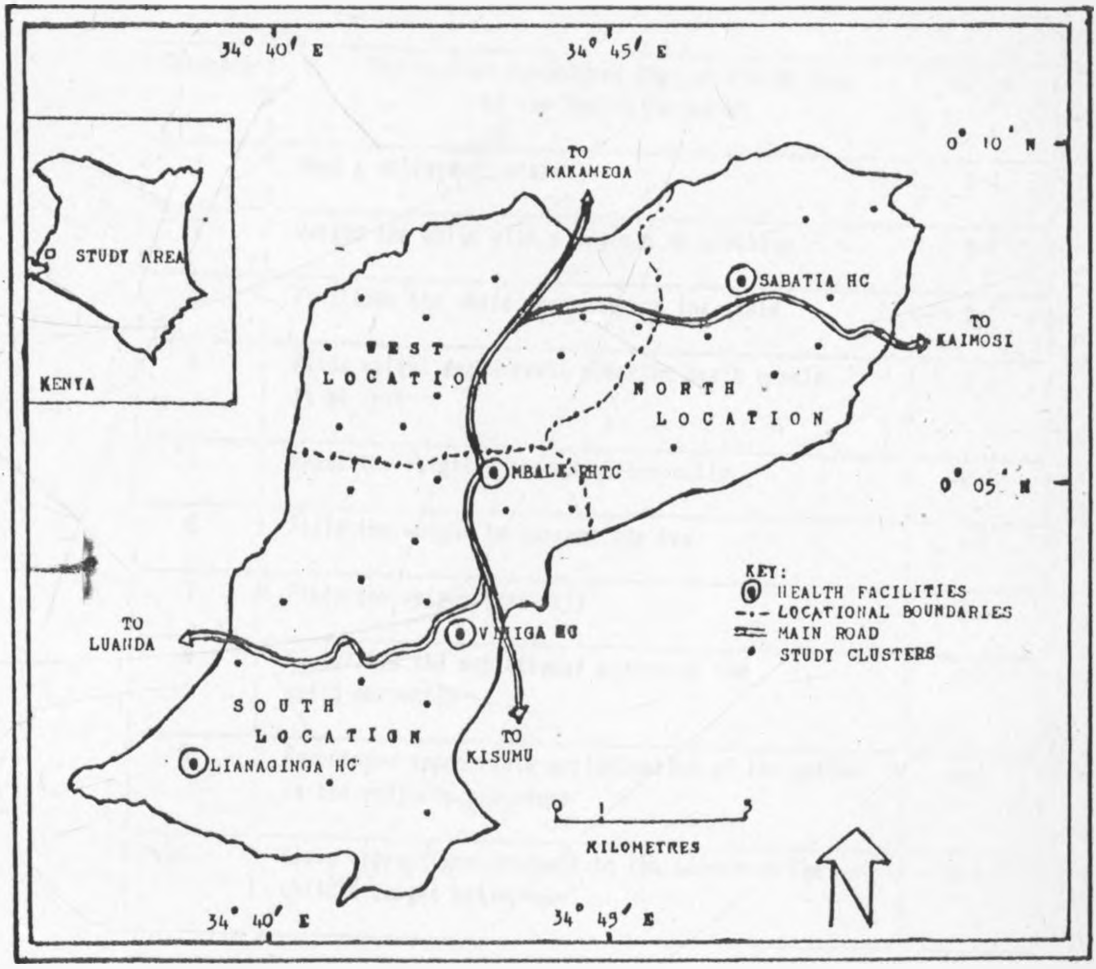
Col 31	Col 32	Col 33
1. Wooden	1. Tiles	1. Mud
2. Cement	2. Iron Sheets	1. Stone
3. Earth	3. Grass	3. Bricks

Nearest H.F.	Distance (Time)	Code	Frequency of use	Reasons for Type of use	Code
34		35-37	38		39

Col 34	Col 38	Col 39
1. Vihiga	1. Most of the time	1. Free Drugs
2. Sabatia	2. Sometime	2. No Drugs
3. Lianaginga	3. Never used	3. Quick Service
4. Mbale		4. Attends Clinic only
		5. Nearest GH Facility
		6. For Treatment only
		7. 6 and 4
		8. Prefers to go elsewhere
		9. Health facility is far.

APPENDIX J

VIHIGA DIVISION MAP SHOWING LOCATIONAL BOUNDARIES AND THE SITES FOR THE RANDOMLY CHOOSEN STUDY CLUSTERS



APPENDIX K

SCORING SYSTEMS

K.1 SCORING OF THE HEALTH CADRES SKILL IN WEIGHING

Category	The Correct Procedures that should be done by the Health Personnel	Score
1	Uses a calibrated scale	0-1
2	Weighs the child with a minimum of clothing	0-1
3	Positions the child correctly on the scale	0-1
4	Reads weight measurement when the scale needle is at rest	0-1
5	Reads the weight measurement correctly	0-1
6	Fills the weight in correct age box	0-1
7	Plots the weight correctly	0-1
8	Classifies the nutritional status of the child correctly	0-1
9	Encourages appropriate participation of the mother in the weighing procedure	0-1
10	Gives appropriate feedback to the mother on the child's weight measurement	0-1

K.2 SCORING OF THE HEALTH CADRES SKILLS IN NUTRITION COUNSEIL ING

Category	Procedures Scored	Score
1	Reason for giving advice/counseling are appropriate	0-1
2	Health cadre knows the age of the child	0-1
3	Comments on the child's weight and health status are appropriate	0-1
4	Information on the child's economic and sanitary environments is obtained	0-1
5	Relevant nutrition advice is given on : i) Food mixtures	0-1
	ii) Frequency of feeding	0-1
	iii) Breastfeeding	0-1
	iv) Ways of improving mother's diet	0-1
	v) Advantages of immunization and regular weighing	0-1
6	Mother takes an active part in the discussions	0-1

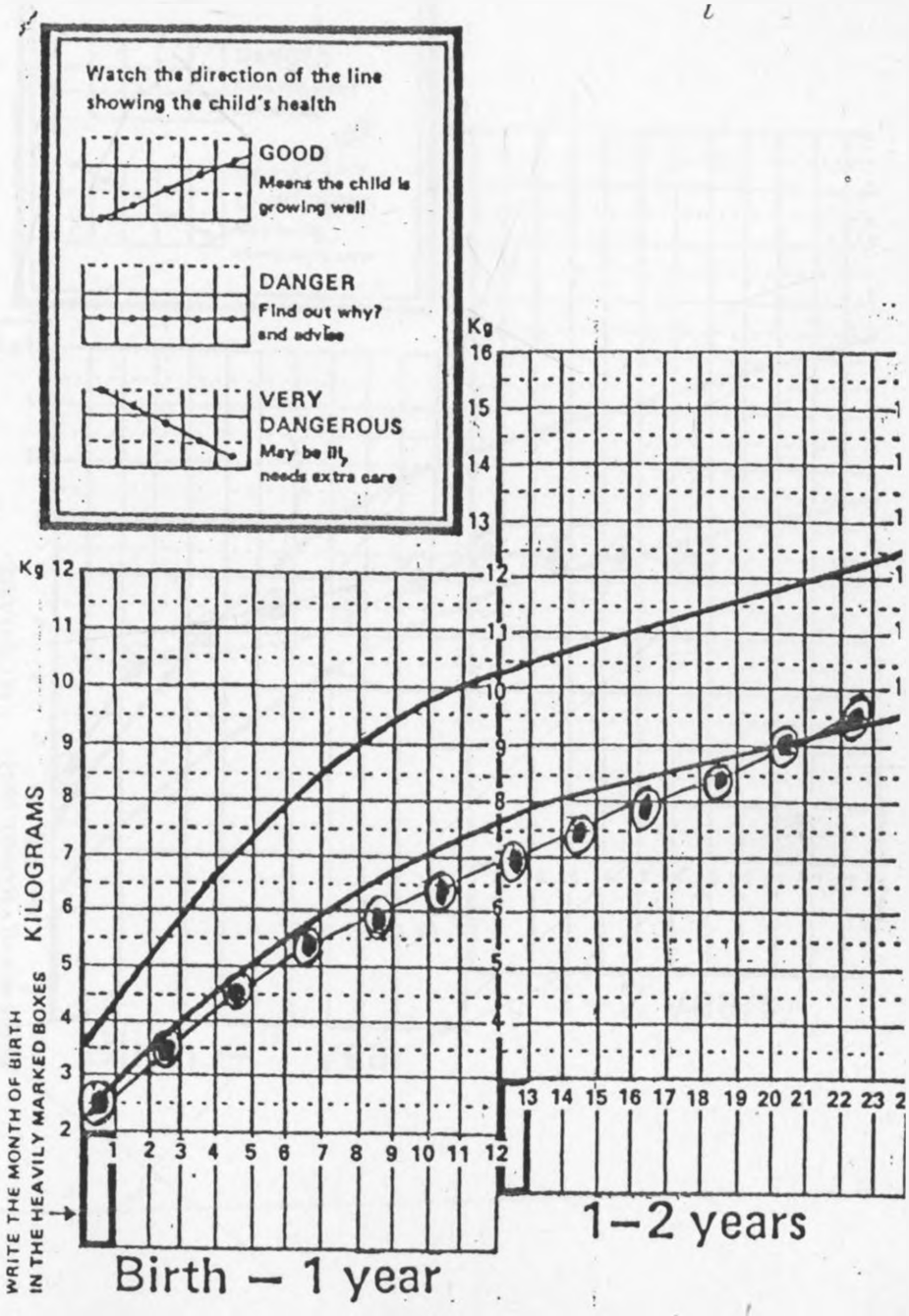
K.3 ASSESSMENT OF THE HEALTH CADRES KNOWLEDGE ON USE OF GROWTH MONITORING INFORMATION

Category		Correct Answers	Score
Reasons for collection the growth monitoring data	1	Detect early signs of growth faltering	0-5
	2	Discuss with mother child's progress	0-5
	3	Know No. of children who are malnourished	0-5
Use of the child growth monitoring data	4	Identify areas in the community that have health and nutrition problems	0-5
	5	Know defaulters from the programme	0-5
	6	Plan home visits	0-5
Ways of dealing with the at risk child	7	Refer for treatment	0-5
	8	Follow at home	0-5
	9	Give advice on proper weaning	0-5
	10	Find out the social background of the child	0-5

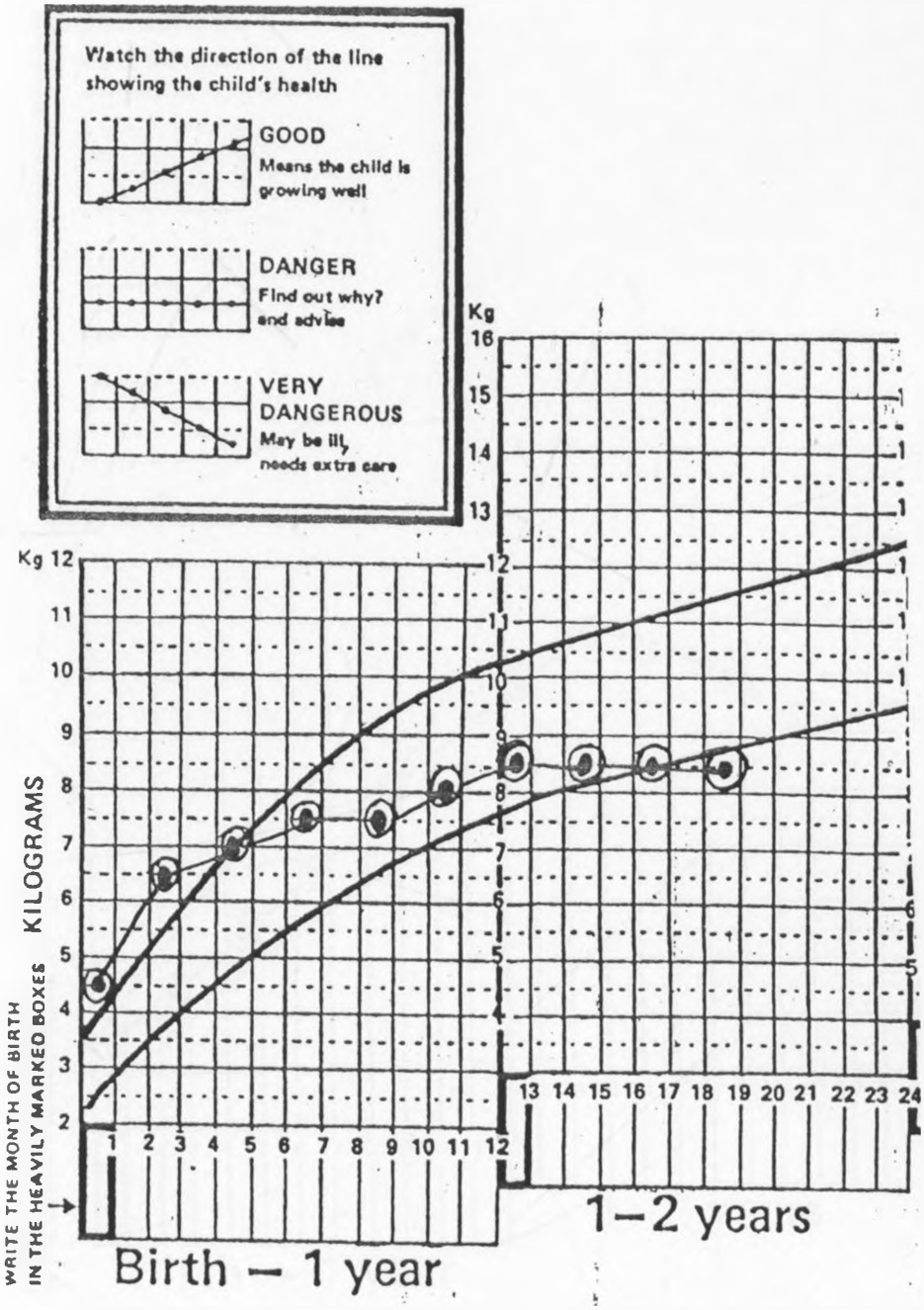
APPENDIX L

GROWTH CURVES USED TO ASSESS MOTHER'S ABILITY TO INTERPRET THE GROWTH TRENDS

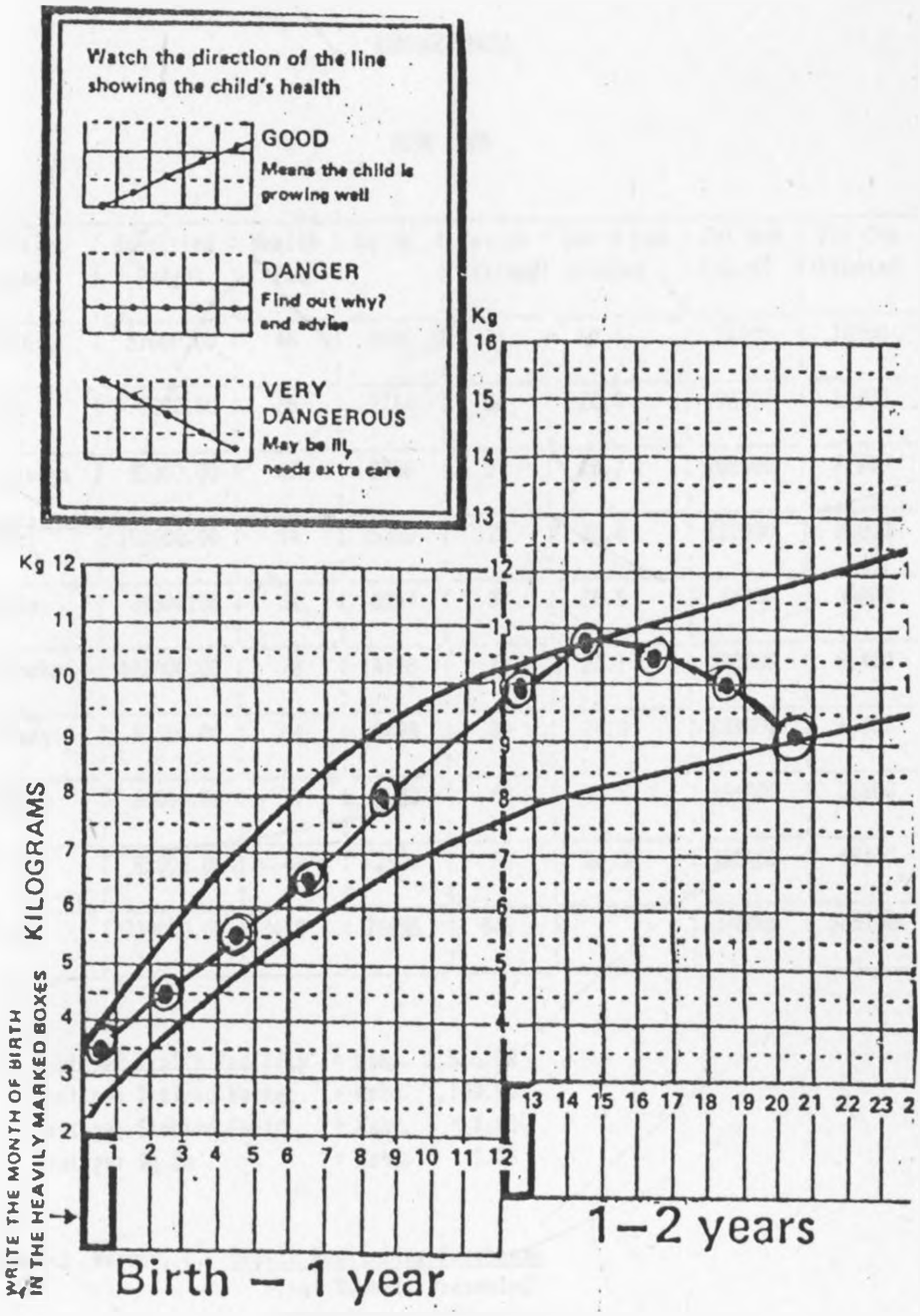
L.1 GROWTH PATTERN BELOW THE STANDARD LINE.



L.2 A STATIC GROWTH PATTERN



L.3 A DANGEROUS GROWTH PATTERN



APPENDIX M

DISTRICTS RECEIVING IMPLEMENTATION MONEY IN GOK FISCAL YEAR 1985-86

SUMMARY DATA

YEAR 1985

District Name	Submitted Budget	Health Fac	Sq Km	People trained	Est % Chn Stunted	Est Num Chn <5	Est Chn Stunted
Baringo	57000.00	46	9885	74	19.4	54000	10500
Embu	76000.00	35	2714	60	22.3	76000	16900
Kakamega	65000.00	47	3496	74	26.7	289000	77200
Kitui	162000.00	44	29388	120	30.0	122000	36600
Kwale	38000.00	31	8257	36	38.5	78000	30000
Machakos	103000.00	78	14178	76	23.1	283000	65400
Murang'a	81000.00	64	2476	88	24.8	189000	46900
Nakuru	86000.00	77	5769	60	34.5	161000	55500
Siaya	62000.00	47	2522	58	36.6	126000	46100
Total	730000.00	469	78685	646		1378000	385100

Cost per Health Facility = Kshs. 1,556.50
Cost per Trained Worker = Kshs. 1,130.03
Cost per Stunted Child = Kshs. 1.90
Cost per Sq Km = Kshs. 9.28

Source : Werner, L. Growth Monitoring Programme
Final Report, Presented
1st September 1986, UNICEF
Nairobi.

APPENDIX N

HEALTH FACILITY PROGRAMME IMPLEMENTATION SCHEDULE

NUTRITIONAL SURVEILLANCE AND GROWTH MONITORING AND PROMOTION PROGRAMME

Stage I of Implementation

The implementation team from each of the nine pilot districts attended a one-week trainers workshop in Tiwi in early November, 1985. The objectives and activities of the National Growth Monitoring and Promotion programme were defined. The responsibilities of the implementation teams were documented and their workplan and budget for implementation in their respective districts were developed.

Stage II of Implementation

The implementation teams returned to their respective districts to consult with the entire District Health Management Team and to finalize their workplan/budget. This was submitted to UNICEF for funding. Appendix M provides a more detailed breakdown of budgets for the various districts.

Stage III of Implementation

Implementation of the workplan was began once funds were made available. Imple-mentation took place between October and December, 1985. For each group of Health facility personnel, training sessions of two full days were conducted. The personnel trained included officers-in-charge, Nutritionists, Nurses and Statistical clerks all of whom were involved in the operation of the Child Growth Monitoring programme at the Health Facility.

Stage IV of Implementation

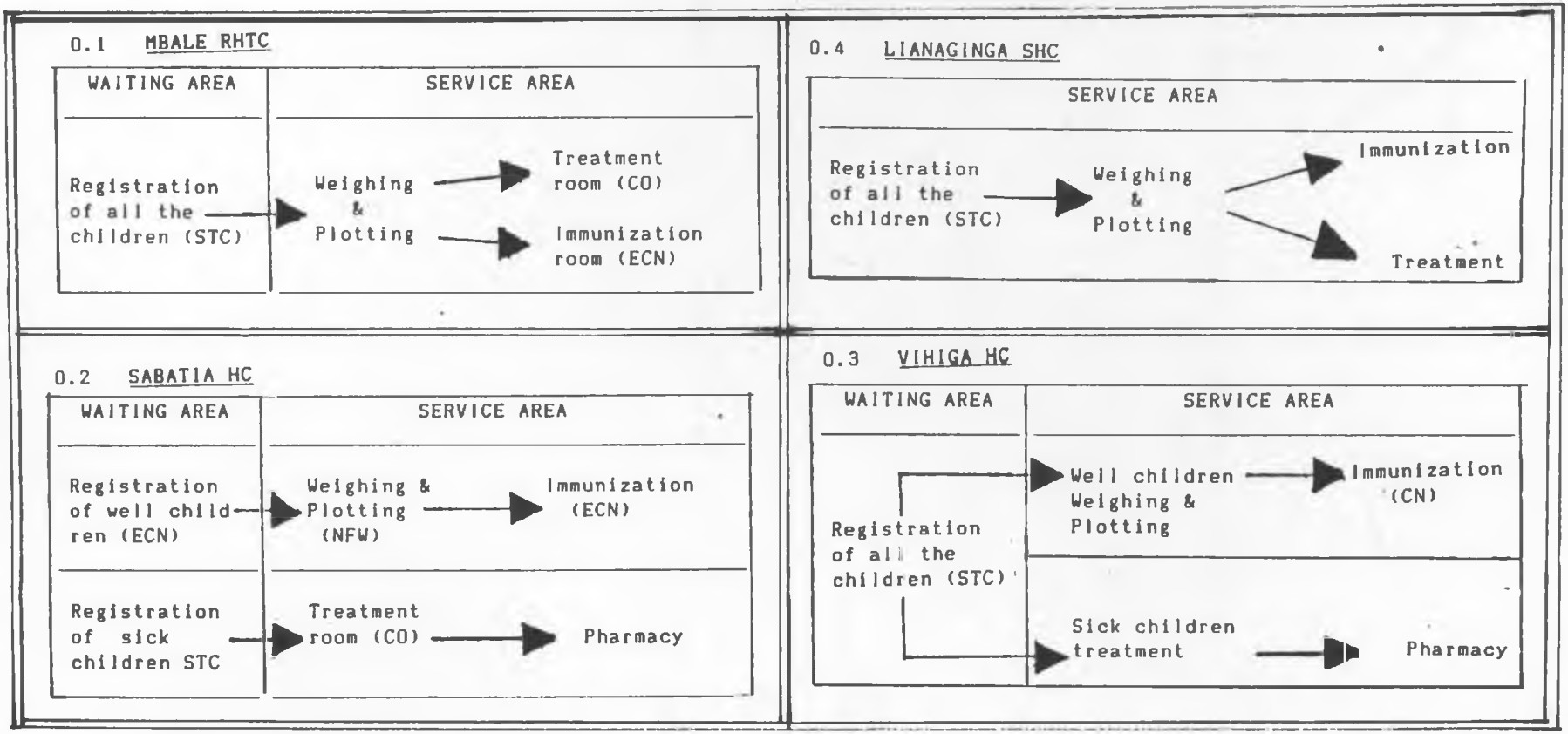
After the training of the Health Facility personnel the district implementation teams visited each Health Facility implementing the Child Growth Monitoring completion of these visits.

Stage V of Implementation

A three day evaluation seminar was held in January, 1985. Each district implementation team presented their evaluation report. The programme as a whole was discussed and evaluated. Implementation of growth monitoring in the community was introduced and discussed and the districts were briefed on the current methods and materials under consideration.

APPENDIX O

ORGANIZATION OF HEALTH FACILITY PATIENT LINES OF FLOW : VIHIGA DIVISION - KENYA



APPENDIX P

SUMMARY TABLE ON CONDITIONS OF HEALTH FACILITY SURROUNDINGS :
VIHIGA DIVISION - KENYA

Health facility	Condition of buildings	Maintenance of grounds	Availability of water	Toilet facilities	
				Availa-bility	Clean-liness
Sabatia	in good state of repair	satisfactory	very regular	none available	not appl-icable
Vihiga	in very poor state of repair	satisfactory	very irregu-lar	none available	not appl-icable
Mbale	in good state of repair	satisfactory	regular	available	not sati-sfactory
Lianaginga	in good state of repair	satisfactory	very irregu-lar	none available	not appl-icable

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APPENDIX Q

SUMMARY TABLE ON PROVISION OF SERVICE AREAS FOR CHILD GROWTH MONITORING : VIHIGA DIVISION - KENYA

Health Facility	Service area	Location	Sitting arrangements	Adequacy
Sabatia	all services	inside the building	available but not enough	room to small. No nutrition counseling area
Vihiga	Registration	Verandah	"	"
	other services	inside the building	"	"
Lianaginga	all services	"	"	"
Mbale	registration	corridor	available & adequate	adequate
	immunization	inside the building	"	"
	other services	corridors	"	No nutrition & counseling area

APPENDIX R

SUMMARY TABLE ON AVAILABILITY AND MAINTENANCE OF CHILD GROWTH MONITORING RECORD FORMS : VIHIGA DIVISION - KENYA

TYPE OF RECORD FORM	HEALTH FACILITY			
	VIHIGA	SABATIA	MBALE	LIANAGINGA
Follow-up Register	Good condition Figures not clear Records of home visits available	Dirty Figures not clear A total of 204 home visits	Very dirty No figures are shown No record of home visits	good condition Figures not clear No record of home visits
Tally sheets	Correct procedure used	Wrong procedure Chaotic	Wrong procedure	Correct procedure
One month summary sheets	Wrong figures sent to head-quarters	Not filled Not readily available Data missing for one month	Filled Readily available Data missing for two months	Filled Readily available
Six months summary sheets	Correct forms filled but with wrong figures	Data forms not available	Data forms not available	Data forms not available