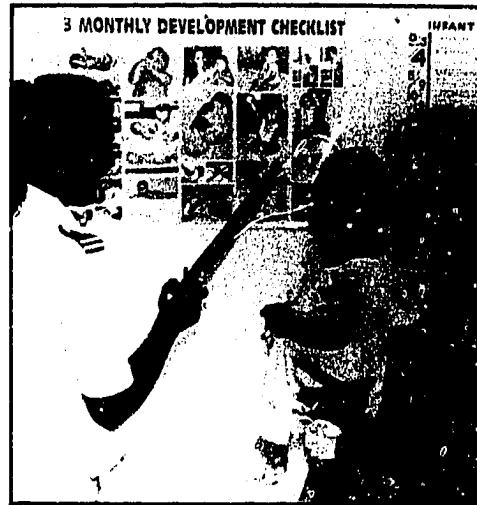


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# GROWTH MONITORING AND PROMOTION: THE BEHAVIORAL ISSUES



**BEHAVIORAL ISSUES IN CHILD SURVIVAL PROGRAMS:**  
Monograph Number Six

Prepared for  
**THE OFFICE OF HEALTH  
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT**

By Ann Brownlee, Ph.D.

**Growth Monitoring and Promotion: The Behavioral Issues**  
Monograph Number Six

Brownlee, Ann (author)

U.S. Agency For International Development, Bureau for Science and Technology. Office of Health. (sponsor)

International Health and Development Associates. 18133 Coastline Drive, Suite 4A, Malibu, CA 90265 (sponsor)

**Behavioral Issues in Child Survival Programs;  
A Synthesis of the Literature with Recommendations for Project  
Design & Implementation (six monograph series)**

\*also available from: International Health and Development Associates. 18133 Coastline Drive, Suite 4A, Malibu, CA 90265

Growth monitoring of young children is recognized as an effective means of detecting growth faltering early, providing a critical opportunity for taking the preventive or curative actions needed. Due to the necessity for active involvement of mothers, health workers and the community in growth monitoring and promotion activities, this child survival strategy has been one of the most difficult to implement. Behavioral and organizational considerations are critical when attempting to improve the performance of these programs. This monograph on behavioral aspects of growth monitoring and promotion concentrates on several major issues, emphasizing the areas that have been most difficult for project design and management. The issues include: (1) local health beliefs and practices concerning infant and child growth; (2) health workers' beliefs and practices affecting growth monitoring project development; (3) strategies for promoting effective individual and community participation; (4) design of growth monitoring technology that takes account of behavioral findings; (5) behavioral aspects of promotional and follow-up activities; (6) expanding and sustaining effective growth

monitoring projects; and, (7) methods for studying behavior related to growth monitoring. As each of these issues is explored, important questions concerning project design and implementation are first outlined, significant findings are then reviewed, and finally recommendations and conclusions are presented for policy-makers and project and field personnel. This monograph is the last in the series which covers the behavioral issues of the following child survival interventions: Oral Rehydration Therapy; Immunization; Breastfeeding, Weaning and Nutrition; and, Growth Monitoring and Promotion.

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**Washington D.C.**

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**INTERNATIONAL HEALTH & DEVELOPMENT ASSOCIATES**

**July 1990**

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## **PREFACE: OVERVIEW OF THE SERIES**

This monograph is the sixth in the series **Behavioral Issues in Child Survival Programs: A Synthesis of the Literature with Recommendations for Project Design & Implementation**. The series covers the major child survival interventions with the exception of birth spacing. It thus includes the following: Oral Rehydration Therapy; Immunization; Breastfeeding, Weaning and Nutrition; and Growth Monitoring and Promotion.

This monograph, like others in the series, sets forth the major behavioral issues related to the intervention, summarizes research findings on each issue, presents recommendations, and includes a bibliography.

### **Behavioral Factors in Child Survival**

Success in child survival projects and programs depends not only on technical interventions themselves but on their being accepted and used by the millions of mothers and other child caretakers who determine in developing countries whether a child lives or dies. This requires that project designers and implementors understand not only the technical but also the behavioral factors that influence child survival in developing countries.

An enormous volume of research has been carried out during the 1980s on topics related to child survival. In addition to basic biomedical research, much of this has been qualitative research designed to provide answers on how to adapt technology, delivery systems, and promotional approaches to individual countries and cultures. Much of this research has been funded by the Agency for International Development (AID/Washington as well as by USAID bilateral projects). Additional research has been supported by UNICEF, WHO, and other organizations, public and private. Many social scientists have also conducted independent research that provides further valuable descriptive material about beliefs and practices of mothers and others that influence child survival.

The findings and conclusions of this large body of qualitative research can be extremely valuable for improving the design, implementation, impact, and sustainability of donor-funded projects and host-country programs.

These research results are not easily available, however, to either AID/Washington or mission personnel outside the countries where individual studies were initiated. Many of the studies have not been published. Some of the reports are still in rough form or in languages other than English. There is no central

repository of these studies. Nor, prior to this series, was there any comprehensive bibliography of research on behavioral aspects of child survival programs. It was for this reason that A.I.D.'s Office of Health initiated the "Behavioral Issues in Child Survival: Literature Review and Consultations Project" which produced this series of monographs and bibliographies.

### **Purpose and Audience of This Series**

The immediate purpose of this series is to bring together the major findings, conclusions, and recommendations of this far-flung body of qualitative research on behavioral issues in child survival projects and programs. The ultimate purpose of this series is to help project and program personnel:

- o First, to understand better the behavioral factors that influence whether and how well parents and other child caretakers utilize child survival services; and
- o Second, to design and implement projects and programs that achieve higher levels of participation, more effective adoption of the new behaviors being promoted, and more sustainable impacts.

The monographs are to be used in AID/Washington, distributed to USAID missions, and made available to host-country counterparts, A.I.D. contractors, researchers, and others engaged in child survival activities.

### **Methodology**

These monographs were prepared in two stages. First was the task of bringing together the published and unpublished literature. This was done by: interviewing and consulting with researchers and research sponsors in the U.S. and various developing countries; sending cables to all USAID missions and letters to researchers in other countries asking for relevant materials; conducting computerized and other searches of the published and unpublished reports; and, finally, acquiring copies of reports and publications that appeared germane. Computerized searches were performed by or accessed collections of the following organizations: A.I.D., UNICEF, Popline, the APHA Clearinghouse on Infant Feeding and Maternal Nutrition, Wellstart, and the International Development Research Centre (IDRC). The second stage was analysis and synthesis of the materials collected. The materials examined for the series include well over a thousand published and unpublished reports of research and studies conducted using qualitative, behavioral science methodologies.



## Criteria for Selecting Materials Reviewed

In deciding what to include from the voluminous literature relating to behavioral aspects of child survival, the following criteria were adopted:

1. Child survival interventions: Concerning ORT and immunization, the goal was to be as comprehensive as possible. Concerning the area of nutrition improvement, on which an enormous amount of research has been conducted, it was decided to concentrate on two areas: (1) breastfeeding, weaning, and nutrition, with the greatest emphasis on breastfeeding; and (2) growth monitoring and promotion. Birth spacing was initially included in the series. Here, given the enormity of the family planning literature, the decision was made to focus on materials that explicitly discussed the use of family planning to increase birth intervals for purposes of maternal and child health. A copy of the initial report, Behavioral Aspects of Child Survival: Birth Spacing, by Soheir Sukkary-Stolba, is available from International Health and Development Associates.

2. Research methodologies: Research and studies included are those characterized as behavioral or behavioral science research, in contrast to biomedical research. Priority was placed on qualitative, as opposed to quantitative, studies. The dividing line is thin, however, as many quantitative studies (e.g. KAP surveys) seek to understand the same types of behavior as do the more clearly qualitative studies. **The goal was to seek studies that researched people's motivations and behavior in an in-depth manner**; some research on socio-economic characteristics has been included, but only when it appears to look in depth at related behavior. Priority was placed on project-related studies and studies of intervention-related behavior (in contrast to research focused more exclusively on traditional behavior--e.g., on mothers' knowledge of ORT as opposed to traditional means of treating childhood diarrhea).

Methodologies examined included those identified as:

- \* ethnographic research,
- \* anthropological research,
- \* in-depth interviewing,
- \* key-informant interviewing,
- \* observation,
- \* participant observation,
- \* detailed activity studies,
- \* focus group studies,
- \* household studies,
- \* community studies,
- \* community diagnosis,

- \* participatory research/evaluation,
- \* social marketing research,
- \* formative research,
- \* motivational research,
- \* practice studies,
- \* audience research studies, and
- \* action research.

Also included, especially when they attempted an in-depth examination of beneficiary behavior, were:

- \* KAP (knowledge, attitudes and practice) studies,
- \* baseline studies,
- \* household surveys,
- \* case studies,
- \* situation analyses,
- \* feasibility studies,
- \* operations research,
- \* pilot studies and surveys,
- \* message testing and product preference trials, and
- \* evaluation research based on longitudinal or other in-depth studies.

Project evaluations are also a rich source of information about behavior. Evaluations of the "rapid appraisal" type that are most commonly conducted on A.I.D. projects have generally not been included in this review, however, as they are the subject of other ongoing A.I.D.-sponsored activities (e.g., at Johns Hopkins University).

3. Behavior: Whose behavior is included? The focus is primarily on the behavior of mothers and other child caretakers, secondarily on service providers in relationship to the mothers and other child caretakers and, third, some organizational factors that directly affect mothers' behavior (e.g., hospital policies on rooming-in as they influence breastfeeding mothers). Other research on organizational behavior and systems has not been included (e.g., no research on management information systems, health care financing arrangements, or Ministry of Health re-organizations).

4. Research sponsor: Priority was given to studies funded by A.I.D., especially in A.I.D.'s 22 child-survival "target countries." Efforts were made to be as comprehensive as possible in finding studies funded by A.I.D. Unfortunately, some were undoubtedly still missed, given the fact that many USAID mission-funded studies never find their way back to Washington. (The same is true of UNICEF-funded field studies which likewise are not all available at headquarters.)

5. Time frame: A time frame of 1980-to-present was adopted at the time the initial draft report was completed in April 1988. Research conducted before 1980 but reported on after 1980 is also included. Some earlier exceptions have been included as judged important for the particular intervention. With a few exceptions, materials produced since April 1988 have not been included.

6. Other: A small number of more general items have also been included. Among these are: literature reviews, policy statements, topical overviews, and methodological materials.

### General Conclusions and Recommendations

1. Further research should build on the findings and cumulative experience to date. Much has been learned during the last few years that can be applied to project design and implementation problems cross-nationally. Issues have been identified and general answers are available. The need is for project and program personnel to use these as a guide and point of departure (rather than reinventing the proverbial old wheel) and only then decide what precise questions remain on a country-specific basis.

2. The findings presented in this series should be further developed to assist A.I.D. personnel in designing and implementing more effective, sustainable projects. Other valuable information in the documents collected for this report but not presented here should also be utilized. Further work should focus on:

- o **Developing explicit procedural guidelines for project personnel to use in design, implementation, and evaluation**. Partial guidance is presented in this report, but recommendations need to be streamlined and more tightly linked to decisions in the project process. This was not possible within the scope of work for this activity.
- o **Synthesizing the lessons and recommendations about methodologies for learning about behavioral factors in child survival**. Mission personnel who are not behavioral scientists need to know, for example, what types of methodologies are appropriate for investigating priority issues, what research can easily be organized in-house, when to call in behavioral researchers, and what sort of guidance to give them. Again, far more has been written than is regularly being used by most USAID missions. Such information is contained or suggested throughout the literature collected for this project. This is a wealth of instructive information that should be summarized.

- o **Analysis of "cross-cutting topics."** Important cross-cutting variables (e.g., socioeconomic status, maternal education, and so on) affect acceptance and use of the child survival interventions. A synthesis of information on these cross-cutting variables can also assist project planning and implementation. These variables are discussed in each monograph as they relate to the particular intervention, but far more is included in the literature collected than could be included here.

### **About the Bibliographies**

As noted above, a selective bibliography accompanies each monograph. For those interventions for which the behavioral literature is voluminous--namely oral rehydration therapy and breastfeeding, weaning, and nutrition--separate volumes, "expanded bibliographies," have been prepared. Copies of the key documents cited are held in the libraries of International Health and Development Associates.

Bibliographies are in Wordperfect 5.0 on floppy discs that could be shared with others. In some of the bibliographies an asterisk (\*) is used to indicate work funded, partially or in full, by A.I.D. (although it has not been possible to identify all A.I.D.-funded reports). In both the Growth Monitoring and Promotion and Breastfeeding, Weaning and Nutrition bibliographies additional codes have been added at the end of certain citations. If the publication is available in a major collection or library (the AID/CDIE collection, APHA Clearinghouse on Infant Feeding and Maternal Nutrition, UNICEF, or Wellstart) this is noted in brackets, along with the document identification number, if available. In addition, the name of the country on which the publication focuses is inserted in brackets if it is not mentioned elsewhere in the citation, thus facilitating computer searches of the bibliographies by country.

Barbara Pillsbury,  
International Health &  
Development Associates

## **ACKNOWLEDGEMENTS**

### **Acknowledgements for Assistance with the Series**

Dr. Pamela Johnson of A.I.D.'s Office of Health, and Manager of A.I.D.'s Child Survival Program, is to be credited for initiating this activity and for her insight into the critical importance for project success of understanding the behavioral issues in child survival.

This series has been a mammoth undertaking. It would not have been possible without the interest and generous cooperation from professionals in many organizations: A.I.D., UNICEF, the World Health Organization, the Centers for Disease Control, the APHA Clearinghouse on Infant Feeding and Maternal Nutrition, Wellstart, the Academy for Educational Development, Management Sciences for Health, Manoff International, John Snow, Inc., Applied Communications Technology, Education Development Center, the Center for Population and Family Health at Columbia University, Water and Sanitation for Health, the International Science and Technology Institute, Johns Hopkins University, the Population Council, the Primary Health Care Operations Research Project, the Carolina Population Center, Pragma Corporation, and the International Development Research Centre. The authors are grateful for the interest shown by colleagues and others in these institutions as well as for the contributions and stimulating input from many individual researchers. Finally, the authors are grateful to Linda Vogel and Terry Gay of the Office of International Health, U.S. Department of Health and Human Services, and to Vivian Sellars of the LTS Corporation for their support of this project.

### **Acknowledgements for Assistance with this Monograph**

I wish to thank the many people who contributed to this monograph. I would like to express my appreciation to all the researchers and field personnel who shared their reports and field experiences with me. Many organizations, including Wellstart, the APHA Clearinghouse on Infant Feeding and Maternal Nutrition, and UNICEF, also gave generously of staff time and supplied numerous documents which were critical to the analysis. I am grateful to all those who reviewed and commented on an earlier version of this report or supplied updated information on important developments in the fast changing field of growth monitoring. I would especially like to thank Dr. Barbara Pillsbury, Dr. Gayle Gibbons, Dr. David Morley, Dr. Derrick Jelliffe, Dr. Marsha Griffiths, and the staff at LTS Corporation.

Ann Brownlee,  
International Health &  
Development Associates

## **EXECUTIVE SUMMARY**

### **Growth Monitoring and Promotion - Its Role in Child Survival.**

Growth monitoring has been defined as "the regular measurement, recording and interpretation of a child's growth change in order to counsel, act and follow up results" (Yee and Zervas 1987). It has been targeted by child survival initiatives such as those undertaken by UNICEF and the U.S. Agency for International Development as an important tool for reducing infant mortality.

Growth monitoring is not an intervention per se, like oral rehydration therapy or immunization, that by itself can result in improved health or survival. Growth promotion activities such as those focusing on health education, counseling, referral and other actions to follow up results are essential. Thus many professionals in the field have suggested that this type of activity be termed "growth monitoring and promotion", to emphasize that action based on the results of assessment is an essential component of the intervention (Hendratta and Rohde 1987, Yee and Zervas 1987).

The advantages of growth monitoring and promotion, if properly implemented, are many:

- o It allows for the early identification of children at high risk of malnutrition.
- o It enhances the transfer of nutritional information by providing the educator with data concerning children's growth patterns that can be used in tailoring advice.
- o It assists in focusing scarce resources such as supplementary food commodities on recipients who most need them.
- o It provides a good opportunity for immunization and other preventive and promotive services, as well as for simple treatment and referral to other health services.
- o When combined with nutrition surveillance, it assists in evaluating the impact of other health and development activities and in identifying groups in need of special health attention.

Although monitoring the growth of young children is almost universally recognized as an effective means of detecting growth faltering early, providing a critical opportunity for taking the preventive or curative actions needed, this Child

Survival intervention has been one of the most difficult to implement. Its adoption on a wide scale has been slow moving (UNICEF 1987b:35). Of all the major interventions stressed in the Child Survival Program, growth monitoring requires the highest level of participation and instruction. Field reports suggest that there are a number of recurring problems that inhibit the implementation of effective projects:

- o Mothers often do not understand the significance of the monitoring activities and are not involved in the measurement of their children.
- o Health workers many times have not been properly trained to take accurate measurements, interpret them, and provide the follow-up support needed.
- o The community has often not been sensitized to the importance of growth nor been mobilized to undertake corrective actions.
- o Measurement equipment is frequently inappropriately designed, expensive, in poor repair or unavailable.
- o Adequate systems for providing follow-up support are often missing, with education sporadic and ill-designed, on-site services poorly organized or non-existent and referral services weak.

**The issues covered in this review.**

This review of the behavioral issues in growth monitoring concentrates on several major issues, emphasizing the areas that have been most difficult for project design and management:

- o Local beliefs and practices concerning infant and child growth
- o Health workers beliefs and practices affecting growth monitoring project development
- o Strategies for promoting effective individual and community participation
- o Design of growth monitoring technology that takes account of behavioral findings
- o Behavioral aspects of promotional and follow-up activities
- o Expanding and sustaining effective growth monitoring projects
- o Methods for studying behavior related to growth monitoring

As each of these topics is explored, important issues for project design and implementation are first outlined, significant findings are then reviewed, and finally conclusions and recommendations are presented. Major conclusions and recommendations emerging from the review of all the issues are presented below, so that busy administrators and field personnel can examine them first.

### **Major Conclusions and Recommendations.**

Major conclusions and recommendations with implications for project design and implementation, emerging from the review of all the issues, are presented below. The recommendations are highlighted in bold, for emphasis.

**1. Traditional methods for monitoring growth.** Project planners should explore traditional methods for measuring growth so that sensitive indicators can be incorporated into project procedures and advice can be linked with what mothers already know. The few studies on this topic indicate that mothers may have a wide range of criteria for deciding whether their children are growing well, including a detailed knowledge of physical changes common in nutritional diseases and various traditional "anthropometric" measures such as the fit of bead strings or clothes. Some traditional indicators may be sufficiently sensitive to provide valuable early warning signs even before weight changes can be detected.

**2. Practices with particularly negative or positive effects on growth.** Explorations of practices particularly detrimental to growth, as well as unusually successful strategies for fostering "adequate growth amidst poverty" should be initiated by projects wishing to strength their growth promotion approach. Practices such as introducing solid foods very late or leaving food consumption decisions completely up to the child, for example, can be quite damaging. An increased focus, on the other hand, on learning from families that do particularly well in adverse conditions -- an approach emphasized in UNICEF's current research initiative -- can also be quite productive.

**3. Attitudes toward weighing.** Project planners should determine whether there is any resistance to weighing of young children in the local culture or to other procedures central to the growth monitoring process. In certain parts of India and Bangladesh, for example, the concept of the "evil eye" causes some mothers to be extremely reluctant to have their healthy children weighed. Weighing is at times seen as degrading, "as if the child were a piece of meat." If concerns such as these are not addressed, attendance at weighing sessions may be poor, and project impact substantially weakened.



**4. Health worker inadequacies and possible training strategies.** Training in growth monitoring for both health professionals and front line workers should be strengthened, as many knowledge and attitude problems are common both at the professional and auxiliary levels. High level professionals, educated to play a curative role, often have little understanding of the detrimental effects on survival of the interaction between malnutrition, growth failure and infection. They often fail to either use growth monitoring as a tool in their own work or act on measurement results collected by those under them. Lower level workers thus are often unenthusiastic about monitoring tasks and may lack the needed technical skills as well. Competency-based training programs focusing on practical knowledge and skills for both monitoring and promotion are essential.

**5. Protocols and supervision.** The use of protocols that provide trainees and workers with specific guidelines on monitoring and promotional tasks to be completed should be considered. Supervision systems that use checklists of this type and provide immediate and specific feedback to workers on improving their performance have been quite effective.

**6. Strategies for involving mothers.** Strategies should be pursued that involve mothers actively in their children's growth and reach not just the more accessible families but also the more disadvantaged groups with high risk children. The neediest children are least likely to be involved in weighing sessions. Approaches that are home-based or at least community-centered, with outreach drives and well-designed incentive programs, may increase involvement of those most at risk. Mothers should definitely keep their children's growth cards and be taught, if possible, to accurately interpret them. In some cases women may even weigh their own children and provide their neighbors with growth-related advice and support.

**7. Approaches to community participation.** Innovative and culturally-appropriate techniques for including the community in all phases of growth monitoring should be developed. Strategies for increasing community awareness are an essential first step and may range from local mobilization efforts to national growth and development initiatives and mass media campaigns. The community can play an important role in project planning, outreach and monitoring itself. Creative strategies for encouraging the community to monitor results have included use of a variety of rosters and graphs for displaying community growth results. Community follow-up actions have ranged from local efforts to provide free or subsidized food for critically malnourished children to various broader development initiatives.

**8. Growth chart design.** Growth charts should be simple and clear, use culturally-appropriate colors and language, and have specific technical features shown to facilitate accurate plotting and interpretation. They should also emphasize weight gain rather than nutritional status. Field reports indicate that errors in plotting and interpretation are extremely common and that cards are often too complex, with culturally unacceptable design features.

**9. Weighing scale selection.** Important design attributes to consider when selecting scales for field use should include maintenance, durability, portability, acceptability, accuracy, potential for user error, simplicity and cost. Bar scales, spring dial scales and tubular spring scales appear to be good choices in many settings. The electronic walk-on and hanging scales are likely to be the solution of the future.

**10. Choice of follow-up activities.** Planners should concentrate maximum effort on what is typically the weakest link in the growth monitoring process -- provision of effective follow-up. Useful activity areas to consider include:

- o Nutritional and health education
- o Preventive and curative services
- o Referral to other health and child care facilities
- o Supplementary feeding
- o Nutritional surveillance and assessment

Selection will depend on the growth and health problems that must be addressed, the capability of the project itself to provide needed services, and a realistic assessment of the health system's ability to provide effective back-up support.

**11. The focus of educational activities.** All monitoring projects should have an educational component which provides mothers with practical advice concerning specific actions to maintain or improve their children's growth between one monitoring session and the next. Useful educational techniques for promoting growth include 1) involving the mothers themselves in message design, 2) developing counseling cards and action posters that provide advice for specific conditions and age levels, 3) using pictures, stories, games, plays, and slogans, 4) fostering effective mother-to-mother exchange, and 5) integrating mass media approaches with face-to-face education.

**12. Supplementary feeding strategies.** If supplementary feeding is necessary it should be focused on high risk children under three who can be assisted in resuming good growth through short term assistance and effective parental education. Food distribution should always be separated from monitoring activities so it doesn't detract from the preventive and educational aspects of the monitoring process. The Tamil Nadu Project in India, using the approach recommended above, was able to economize on food costs by limiting the frequency of participation and by sharper and more selective targeting. By concentrating on the earlier stages of malnutrition among younger children, it was successful in gradually lowering the prevalence of more severe and chronic malnutrition.

**13. Expanding project activities.** When undertaking the difficult task of increasing project scope while attempting to maintain effectiveness and impact, project planners should consider strategies found by other practitioners to enhance possibilities of success. Experience has shown it's useful to:

- o mobilize support from all sectors of society,
- o analyze the features of small scale projects that have enabled them to have substantial impact,
- o explore and, if possible, use systems other expanded programs such as EPI have developed to deal with financial, supervisory, and coordination problems,
- o simplify technology, for example by improving scale design, targeting educational messages more accurately, and streamlining work flow, so wider coverage can be obtained with little added cost, and
- o integrate growth monitoring with other PHC activities while strengthening referral services.

**14. Selecting effective research methods.** Development of well-designed qualitative research studies should be considered by project implementors wishing to solve operational problems. Some of the qualitative methods that have been successfully used in the field include:

- o Community diagnosis and baseline studies
- o Situation analysis
- o Case studies of small and large scale projects
- o Studies of "adequate growth amidst poverty"
- o Systems analysis and use of observational guides
- o Operations research

Additional techniques that may be particularly useful in the growth and nutrition field are described in Monograph Number Four: Breastfeeding, Weaning and Nutrition: Behavioral Issues.

## **INTRODUCTION**

Growth monitoring has been defined as "the regular measurement, recording and interpretation of a child's growth change in order to counsel, act and follow up results" (Yee and Zerfas 1987). It has been targeted by child survival initiatives such as those undertaken by UNICEF and the U.S. Agency for International Development as an important tool for reducing infant mortality.

Growth monitoring is not an intervention per se, like oral rehydration therapy or immunization, that by itself can result in improved health or survival. Growth promotion activities such as those focusing on health education, counseling, referral and other actions to follow up results are essential. Thus many professionals in the field have suggested that this type of activity be termed "growth monitoring and promotion", to emphasize that action based on the results of assessment is an essential component of the intervention (Hendratta and Rohde 1987, Yee and Zerfas 1987).

The advantages of growth monitoring and promotion, if properly implemented, are many:

- o It allows for the early identification of children at high risk of malnutrition, so that causes of faltering growth can be explored and addressed while the problem is still easily reversed.
- o It enhances the transfer of important health and nutritional information by providing the educator with data concerning children's growth patterns that can be used in tailoring advice to particular dietary and health needs.
- o It assists in focusing scarce resources such as supplementary food commodities on recipients who most need them.
- o It provides a good opportunity for immunization and other preventive and promotive services, as well as for simple treatment and referral to other health services.
- o When combined with nutrition surveillance, it assists in evaluating the impact of other health and development activities and in identifying geographical areas or population groups in need of special health attention (NCIH 1987, Lancet 1985:1337).

**Growth monitoring's synergistic role in the Child Survival Revolution.** In many situations growth monitoring is perceived and implemented just as one of the many PHC tasks that must be carried out by the health worker. And yet growth monitoring is unique among the child survival interventions in that it provides for continuity of care and contact with a health provider over two to three years (UNICEF 1986d:12). As Hendrata and Rhode (1987:9) observe:

... (growth monitoring and promotion), properly practiced, is more like a "basket" that contains all other PHC and community development activities together. In the words of Mr. James P. Grant, "G is the thing that holds the whole package (GOBI) together." Unfortunately growth monitoring is often presented in a list of specific interventions: immunizations, oral rehydration, vitamin A capsules, which do indeed have some inherent value, no matter how delivered to the patient. But GMP should be seen as the framework or operational strategy for an entire range of PHC and educational inputs and that the success of each of those inputs can be fostered and improved by their inclusion in the GMP activities. Children participating regularly in growth monitoring programs have higher rates of immunization, better use of oral rehydration, more effective breastfeeding, more appropriate introduction of weaning foods, and their mothers are more likely to practice contraception...

**Difficulties in implementing growth monitoring and promotion activities.** Although monitoring the growth of young children is almost universally recognized as an effective means of detecting growth faltering early, providing a critical opportunity for taking the preventive or curative actions needed, this child survival intervention has been one of the most difficult to implement. Its adoption on a wide scale has been slow moving (UNICEF 1987b:35). Of all the major interventions stressed in the child survival program, growth monitoring requires the highest level of participation and instruction. Without the active involvement of mothers, health workers and the community, growth monitoring will, and often does, function the most poorly of the four GOBI components (Herbert 1987:14). Field reports suggest that there are a number of recurring problems that inhibit the implementation of effective growth monitoring projects:

- o Mothers often do not understand the significance of the monitoring activities and are not involved in the measurement of their children. This lack of involvement is most evident among those most in need.
- o Health workers many times have not been properly trained to take accurate measurements, interpret them correctly, and provide the follow-up support needed.

- o The community has often not been sensitized to the importance of growth nor been mobilized to undertake corrective actions that could greatly reduce the risk of malnutrition in the local area.
- o Measurement equipment is frequently inappropriately designed, expensive, in poor repair or unavailable.
- o Adequate systems for providing follow-up support are often missing, with education sporadic and ill-designed, on-site preventive and curative services poorly organized or non-existent and referral services weak. Food distribution services may be offered indiscriminately and often divert attention from the preventive aspects of the intervention (Tremlett 1985:4, Jelliffe and Jelliffe 1990).

**The issues covered in this review.** Behavioral and organizational considerations are critical, as can be seen, when attempting to improve the performance of growth monitoring and promotion activities. Growth monitoring has been one of the least studied of the child survival interventions, although there have been a few excellent investigations in recent years. Evaluations and assessments by experienced field practitioners have provided some additional useful information. The field is a fascinating one from the behavioral aspect, with issues as diverse as community participation, design of appropriate measuring instruments, and strategies for follow-up often requiring quite different investigative approaches.

This review of the behavioral aspects of growth monitoring and promotion concentrates on several major issues, emphasizing the areas that have been most difficult for project design and management. The topics include:

- o Local beliefs and practices concerning infant and child growth
- o Health workers beliefs and practices affecting growth monitoring project development
- o Strategies for promoting effective individual and community participation
- o Design of growth monitoring technology that takes account of behavioral findings
- o Behavioral aspects of promotional and follow-up activities
- o Expanding and sustaining effective growth monitoring projects
- o Methods for studying behavior related to growth monitoring

As each of these topics is explored, important issues for project design and implementation are first outlined, significant findings are then reviewed, and finally conclusions and recommendations are presented. Major conclusions and recommendations emerging from the review of all the issues are presented in the executive summary, so that busy administrators and field personnel can examine them first.

The issues for project design and implementation, which are boxed in the text and presented at the beginning of each section of the monograph, are stated in question form. Researchers and program staff wishing to explore behavioral issues influencing child survival programs in a particular culture can use these series of questions as checklists, since they cover most of the important factors that can be investigated.

**The collection and organization of documents.** The literature that deals directly with growth monitoring and promotion is not by far as extensive as that for certain of the other child survival interventions such as oral rehydration therapy or breastfeeding, weaning and nutrition. It does, however, include some very useful documents, including published and unpublished research papers, field project documents and agency reports. Some of the materials are available in UNICEF's headquarters library, but other items come from a wide range of donor agencies and field sources. The majority of the bibliographic materials reviewed for this report were written or published between 1980 and early 1988, when most of the review work for this monograph was completed.

The bibliography at the end of this monograph covers both the references cited as well as other documents that were identified during this review. Because the literature was less extensive than that for oral rehydration therapy or breastfeeding, it was not necessary to place the full bibliography in a separate volume.

Additional materials pertinent to the follow-up or promotional aspects of growth monitoring, in particular those concerning infant feeding, may be found in Publication Number Five in this series, **Breastfeeding, Weaning and Nutrition: Expanded Bibliography.**

**The purpose of this report.** This review was undertaken in order to bring together the major findings, conclusions and recommendations of this widely scattered body of literature into a single report in a format easy for both AID policy makers and field personnel to use. The bibliography also serves as a guide to the literature itself, with many of the major documents on behavioral aspects of growth monitoring and promotion now available in one collection.

## BEHAVIORAL ISSUES AND SIGNIFICANT FINDINGS

### I. Local Beliefs and Practices Concerning Infant and Child Growth

#### Issues for Project Design and Implementation

How do mothers and other caretakers assess the growth of their children? What do they normally do to help their children grow and what do they do when their children are not growing well?

How can this knowledge of how mothers view growth and what they do in times of progress and periods of crisis be used to develop more effective growth monitoring projects?

What are the common attitudes of mothers and other community members towards weighing and other growth monitoring techniques? Do they understand techniques commonly used? Are the methods accepted as appropriate and useful?

#### How Mothers Monitor Their Children's Growth

Mothers and other family members have traditionally used a variety of indicators and milestones when assessing their children's growth. The signs used and local standards children are compared to vary culturally, but are important factors affecting child care practices. An understanding of local beliefs and perceptions related to growth can be quite useful for project planners, and yet surprisingly few studies have explored this topic in any depth.

One quite productive community survey in central **Ghana** did examine closely the growth related beliefs and practices of local mothers and families in order to suggest ways of applying the information to improve growth monitoring at the local level (Lovel et al 1985). One key question concerned how mothers know when their children are growing or not growing well. The responses were rich and comprehensive in scope, covering indicators such as appetite, stages of physical and mental development, general health and appearance and the feel and look of the skin. Height and weight were also mentioned, as well as variations in mood and activity level.



A wide range of physical changes both for periods of good and poor growth were mentioned. Children growing well cry and move normally. When growth is poor the abdomen becomes distended, bigger than normal, the hair turns brown or grayish, the face puffy or pale, the fontanelle sunken or large. Observations were both sensitive and detailed, and often included accurate descriptions of the signs of anemia and dehydration, two major causes of child mortality in Ghana. Size was emphasized, with clothing often mentioned as a useful indicator: "In poor growth, 'dresses become loose around the body and clothes bought for a young child are still a good fit many months later'."

Traditional "anthropometric" measures were some of the most interesting. It is customary in central Ghana, as in many other cultures, to make strings or beads for a newborn and put them around the waist, wrists and legs. They are intended as decoration but used by many parents to assess growth. "One mother explained that by the time the child had reached the age of 5 months, the bead-strings around the waist should have been changed or adjusted five times." Other items mentioned included metal bracelets, necklaces and finger rings (Lovel et al 1985:1-3).

A baseline survey in two poor districts of India covered by the Integrated Child Development Services Scheme (ICDS) also attempted to explore local perceptions of growth and nutrition, though not in as great detail as the Ghanaian study. Results indicated that more than half the mothers could correctly perceive their children's nutritional status, even without weighing. They mentioned using indicators for good growth such as that the child is heavier to lift, the black waist strings gets tighter and the child outgrows its clothes (Anderson 1986).

### Understanding and Acceptance of Growth Monitoring Procedures

Limited use of weighing as a growth indicator in some cultures. While the few studies available indicate there may be many traditional methods for measuring growth, other reports indicate that mothers in certain cultures do not normally consider weighing as a customary method for estimating growth. Even in the Ghana study, only a few mothers mentioned the weighing scale at the clinic in relation to recognition of failure to grow. Mothers (like many health professionals) often focus more strongly on the relative size and weight of their children than on the importance of continual growth. As Hendrata and Rohde (1987:5) comment, "Mothers need to understand and to appreciate the importance of gaining weight, recognizing that children come in varying sizes but that all healthy children must grow."

**The value of using traditional indicators in growth monitoring projects.**

The detailed results from central **Ghana** suggest that traditional concepts of growth can involve a quite comprehensive and multifaceted view of child development. The wide range of local indicators may in some ways compensate for the imprecision of some of the traditional monitoring techniques (Lovel 1985 et al:3).

A knowledge of local indicators of good and poor growth can be quite valuable to project design. When growth charts are introduced, health workers can stress that this new type of measurement can be used alongside mothers' own methods of assessment and indicate how it can add to what they already know. This is particularly important in cultures where weighing with scales is not a traditional method of growth measurement. Monitoring of weight may have some advantages over traditional measures such as lifting or observing the fit of beadstrings, as it may alert the mother or health worker earlier to growth faltering and thus to the very initial stages of illness or malnutrition. Further research is needed concerning the sensitivity of traditional indicators. It may be that certain behavioral changes occur even before fluctuations in weight. Thus health workers may find it valuable to integrate traditional approaches into their system, working jointly with mothers to make productive use of their observations in addition to the results of the weighing exercise (Lovel et al 1985:4).

**Resistance in certain cultures to weighing children.** In most cultures, weighing of children is not a particular problem, although mothers may dislike the process if their children are scared and upset when lifted by strangers into weighing pants or scales high off the ground. In certain parts of **India** and **Bangladesh**, however, there appears to be some cultural resistance to weighing young children. The Rural Unit for Health and Social Affairs (RUHSA) Project in **India** reports that mothers resist having their children weighed regularly, although they are otherwise very cooperative and willing to try new practices to improve their children's health or development. An Indian delegate to the 1985 global meeting on "Growth Monitoring as a Primary Health Care Activity" reported:

"There is in the community the concept of the "evil eye" where weighing a well child is detrimental to its health. This belief is very prevalent in the community, though attitudes are slowly changing and mothers who have gone through special education programmes...are less likely to have this belief. Other mothers believe that weighing is only for sale of goods/produce such as rice, meat, vegetables, etc. Mothers do not want to "sell their children". Thus, a certain prejudice in the community to weighing, especially health children, exists and needs to be adequately tackled." (FIW 1985:66-67).

Deep-seated resistances such as these have been found to be a major barrier to successful measurement in certain projects on the Indian subcontinent and in some other regions.

In certain cases there may be resistance simply because mothers feel weighing of children with a market type scale is a dehumanizing process. In other cases, mothers may be reluctant to undress their children completely before weighing either because of cold weather or because they are concerned that using communal weighing pants may be unsanitary (Nutrition Communication Project 1989:29). Issues such as these must be addressed if weighing is to remain (or, in some cases, become) a central growth monitoring strategy.

### **Traditional Methods for Fostering Growth and Coping When Growth Appears to be Faltering.**

Traditional infant and child feeding practices and remedies used for illness or diarrhea, all examined other parts of this report, indicate that there is wide variation in what families do and believe is important to foster growth and health.

**Lack of awareness of the relationship between certain feeding practices and growth.** In some cultures, understanding of the relationship of certain key practices to children's growth may be limited. As suggested in the review of weaning practices, for example, families in certain cultures are unaware that children four to six months of age and older need substantial amounts of supplemental foods in addition to breastmilk in order to continue to thrive. Mothers in these circumstances may provide much less food than is needed for normal growth. The period between six months and two years is thus a critical one in many cultures: lack of adequate food intake combined with the common problems of contamination and infection lead to widespread growth faltering, illness and death.

In a peri-urban area near **Bamako, Mali**, for example, a study indicates that families generally believe that a child doesn't need to eat solid food before he is about eight months old. Children are thought to know themselves what food they need, and are usually left to take what food they want, with little feeding or forcing of a child to eat. Lack of appetite and even anorexia appear to be common problems during the weaning period, often resulting in severe growth failure and malnutrition, and yet the Malian women questioned don't appear to draw a clear connection between lack of sufficient solid foods and the common resulting problems in growth (Dettwyler 1986). Similar patterns and problems have been observed in many other cultures as well. Mothers served by the ICDS project in **India**, for example, generally wait for a signal from the child to know when to introduce solid foods and are

equally reluctant to urge a child with little desire for food to eat (Anderson 1986, MODE 1986).

**The importance of designing growth monitoring activities to address problems such as these.** Use of traditional guidelines for introducing solid foods, such as waiting until "when the child asks or reaches out for it" or "when the child starts walking or has teeth to chew" may mean that the child normally begins receiving foods only after a year or more, whereas solids should be introduced by six months of age. If project planners and health personnel involved in growth monitoring activities are aware of problems such as these, they can begin to design more effective nutrition education follow-up strategies. They may even be able to promote weighing results as an indicator that can be added to the mothers' repertoire for deciding when changes in feeding practices are needed (Anderson 1986).

**Focusing on "adequate growth amidst poverty," or learning from those who do well.** The observation that "growth is poor because the people are poor" doesn't explain the wide variations in growth patterns, even among children of the same socio-economic groups (Dettwyler 1986). Nutrition epidemiologists in recent years have focused more commonly on analyzing malnutrition and examining failures. It may be quite productive, as the report from a recent UNICEF consultation suggests, to spend more time learning from "successes" by exploring what leads to "adequate growth amidst poverty", or "AGAP", as advisors termed it (UNICEF 1986d:35).

Results from studies of these "positive deviants", may assist project planners in discovering what strategies may be most useful in promoting growth and health when socio-economic conditions are less than ideal. Adequate growth amidst poverty is probably partly biological (due to the child's body performing better in spite of poor conditions) and partly social and behavioral (when a mother does a better job managing the child's life under conditions where resource constraints are severe) (UNICEF 1986d:35). Studies of what causes some children to grow well in adverse circumstances can be quite useful to designers of growth promotion efforts, and thus advisors at the above mentioned consultation recommended that this play an important part in UNICEF's future research agenda.

**An example of "positive deviance" research.** The study of infant and weaning practices in Mali mentioned earlier provides one useful example of the type of information that may be obtained when research focuses on why some children do well. While conditions in the peri-urban area studied near Bamako were generally poor, some children grew above the 50th percentile of NCHS standards. Socio-economic status could not account for the variation in nutritional status. Another important factor, termed "maternal attitude" was found to have a highly

significant relationship with how well children did. The various beliefs and practices related to infant feeding and medical care tended to form divergent clusters, which allowed ranking households according to "maternal attitude". As the study observes:

"A mother with an 'above average' maternal attitude is one who always makes sure her child is awake and present at meals, fixes foods that the child especially likes, buys him extra food on a regular basis, takes him to the doctor when he is sick, and purchases the prescribed medications. A mother with a 'below average' maternal attitude is one who lets her child sleep or play through meals, does not cater to his food preferences or buy him extra food, and is less likely to consult medical personnel when he is sick, spend money for prescribed medications or administer medications consistently" (Dettwyler 1986:660).

Mothers with above average maternal attitudes were found to have children with significantly higher average weight for age than those with poor maternal attitudes. Information such as this can provide important clues concerning the most effective strategies to use in nutrition education and other interventions following growth monitoring activities.

### **Conclusions and Recommendations**

**1. Traditional methods for monitoring growth.** Project planners should explore what indicators are traditionally used by local families to assess whether children are growing well or poorly so that nutritional advice can be linked with what mothers already know, and useful local growth indicators can be incorporated. Investigations of traditional methods for monitoring growth are few, but several recent studies indicate mothers often have a wide range of criteria for deciding whether their children are growing well, including signs such as activity level, general appearance, progress toward developmental milestones, symptoms such as appetite and mood changes, and various traditional "anthropometric" measures such as the fit of bead strings and clothes. Growth monitoring project personnel may be able to show mothers how periodic weighing can add new information critical to detecting early growth faltering. Workers may also find that some traditional indicators are sufficiently sensitive to provide additional useful "early warning signs" that indicate poor growth even before weight changes are detected.

**2. Traditional practices with negative or positive effects on growth.** Explorations both of common maternal practices that lead to faltering growth and successful family strategies for fostering adequate growth amidst poverty should be undertaken by projects desiring to strengthen their growth promotion strategies. Practices found in some cultures, such as that of introducing solid foods

very late and leaving the amount eaten up to the children themselves, for example, can greatly increase the likelihood of dangerously faltering growth during the weaning period. Practices such as these should be targeted during growth promotion activities. UNICEF has recently suggested that much more emphasis should also be placed on learning from families that do well in adverse conditions, and has developed a special research initiative focused on learning from "positive deviants".

**3. Attitudes toward weighing children and other growth monitoring procedures.** Project personnel should determine whether mothers understand the significance of gaining weight for their children's health and to what extent procedures such as weighing may be viewed unfavorably in the local culture. In certain parts of India and Bangladesh there appears to be some cultural resistance to weighing among families that believe in the "evil eye" and feel weighing a well child may be detrimental to its health. In some countries weighing a child "like a piece of meat" is thought to be degrading. It is important to determine to what extent attitudes or beliefs such as these exist so strategies for addressing them can be explored.

## II. Health Worker Beliefs and Practices Affecting Growth Monitoring Project Development

### Issues for Project Design and Implementation

What health worker beliefs and practices may hinder (or assist with) development of an effective growth monitoring project?

How can worker effectiveness be increased?

### The Influence of Health Professionals' Knowledge and Attitudes on Growth Monitoring Activities

When asked what advice she would offer to others as a result of her experience as director of the growth monitoring campaign in **Ecuador**, one of Dr. de Grijalva's major observations was that while many feel improving mothers' understanding is a difficult task, working with health professionals is the true challenge: "We believe it will be most important now to initiate a strategy of motivation and training of health professionals, beginning with the doctors. Unfortunately, doctors know very little of such things as nutrition education or even nutrition" (Mothers and Children 1986).

Problems inherent in the curative approach to education for health professionals. Medical and nursing schools place little emphasis on growth and nutrition, or on health promotion in general, in their curricula. The failure of medical education to emphasize the interaction between malnutrition, growth failure and infection and its role in maintaining high morbidity and mortality rates among vulnerable groups results in a later lack of professional interest in this problem (Rueda-Williamson 1986:8).

In addition, health professionals' education provides little experience with the types of communication tools necessary for effective follow-up activities. Physicians and nurses are not well trained in an interactive communication approach, and tend to use the lecture method they were subjected to during training, while the key focus in growth monitoring education should be on "listening" rather than "telling" (Hendratta and Rohde 1987:7).

**Lack of interest in growth monitoring at the professional level discourages lower level workers.** The fact that in many countries health professionals at the higher levels both fail to use growth monitoring as a tool in their own practice and neglect to review or use weighing or measuring results collected by those under them discourages many auxiliary workers (Delgado et al n.d.:10, Tremlett 1985:5). In certain parts of **Southern Africa**, one field report suggests, since doctors in prestigious institutions do not use growth monitoring, it is often seen as "poor man's medicine" (UNICEF 1986d:51).

### **Typical Health Worker Problems with Charting Growth, Interpreting Results and Providing Appropriate Follow-up**

In addition to problems of attitude, front-line workers in many places have major problems in the skill and knowledge areas. Workers often do not understand the function of monitoring growth and development and many times have neither the skills to do it adequately nor the knowledge to take appropriate follow-up action (Tremlett 1985:4).

**Problems with measuring and charting.** In a review of global experience in growth monitoring, Gopalan and Chatterjee (Lancet 1985:1337) suggest that primary level workers are generally concerned only with the degree of the child's malnutrition rather than the shape of the growth curve. Often dots on the charts are left unconnected and low gain is not seen as a cause for alarm. An historical perspective may indicate some of the origins of this problem. The nutritional surveillance activities, which have been undertaken for much of this century, have primarily focused on measuring nutritional status. Only in the past couple decades has the monitoring of individual children's growth for preventive purposes become common.

It is interesting that when the Road-to-Health card was first used, health workers evaluated the adequacy of growth by the position of the last dot on the child's chart in relation to the cut-off lines. Only more recently have workers been taught that the change that takes place between weighings and the slope of the curve is most critical (Griffiths 1985:27). Two of the most important types of cases that are misinterpreted include 1) the child who is in the normal range on the curve but losing weight, and 2) the child that is classified as undernourished but is now gaining weight. Workers often believe the first child is healthy because his weight is still in the normal area of the curve while, in fact, he needs immediate attention. Because the second child is still on the low end of the chart, workers may feel he is in danger and fail to reinforce positive changes made by the mother that are now assisting in his recovery (Griffiths 1985:95-60).



In some programs where attendance rates for growth monitoring sessions are low, information on changes in weight may not be available to health workers, and they may have to rely on the information conveyed by a single weight figure at a particular point in time (Nabarro and Chinnock 1988:945).

**Insufficient use of the data obtained.** Appropriate use of measurements collected, however, is the greatest problem areas, according to most observers. Not only are interpretations often faulty, but little or nothing is done by many workers to take effective follow-up action when its need is evident. When follow-up action does take place, it is too often solely in the form of food supplements. There is little emphasis on infection or other illness as possible causes of growth failure, and systems for referral are generally inadequate. In projects where weighing is time consuming and follow-up minimal, mothers who believe that their time is being wasted by the exercise may actively be discouraged from participating in other related health care and development initiatives (Nabarro and Chinnock 1988:946). Only in projects where weighing was not seen as an end in itself but as an entry point for effective nutrition education and other well-focused interventions, is the prevalence of malnutrition likely to be reduced (Lancet 1985:1337).

### **Educational Levels Necessary for Growth Monitoring Tasks**

Experience concerning the level of education needed for growth monitoring tasks has varied, although most projects report that education does influence the ability to weigh accurately, to enter the results properly on the chart, and, most importantly, to make correctly interpretations and take appropriate follow-up action (Jelliffe and Jelliffe 1990). Results from India suggest that illiterate volunteers, such as those used in the RUHSA project, have, in general, a low capacity to understand, use and correctly record the weight of children on the growth charts being used (FIW 1985:14). After reviewing several Indian growth monitoring projects, one study suggests that education at an eighth grade level is a great asset in acquiring the skills required (Bhan and Ghosh 1986:4).

Some projects, such as the National Family Nutrition Improvement Program (UPGK) in **Indonesia**, use training techniques that involve repeated practice of the actual skills needed. UPGK reported that after three or four weighing sessions cadres with minimal educational levels could accurately weigh a child in very little time. The use of the local market scale helped make this possible, as it was a familiar and very appropriate technology for the workers concerned (UNICEF/Jakarta 1986:21).

## **Practical Growth Monitoring Training Strategies**

**Revising health training institution curricula.** As the evidence above indicates, further training in the areas of growth monitoring and promotion is essential if projects are to succeed. Curricula in the medical, nursing, and auxiliary schools need to emphasize the importance of growth monitoring and focus on practical strategies for project implementation. The role of nutrition improvement, in general, in contributing to child survival and health needs to be stressed as well (Rueda-Williamson 1986:8).

### **Developing training programs for front line workers.**

Practical, action-oriented training is needed for workers involved in program delivery, not just on the mechanics of weighing and charting (as has often been the case in the past), but on all aspects of monitoring and promotion (Lancet 1985:1338, Tremlett 1985:12). CHWs are often the major village level workers scheduled for training. In a few projects mothers themselves have been taught weighing and charting, as well as other tasks (FIW 1985:85), and in the Child-to-Child program older school children have been instructed in how to weigh and record results for younger siblings. Agricultural extension workers have even been instructed in how to carry out growth monitoring work in certain projects (Jelliffe and Jelliffe 1990).

**Training materials available.** A few excellent reviews provide useful information on growth monitoring training materials currently available. (See, for example, the list of training publications in the WFPHA Issue Paper on Growth Monitoring (Griffiths 1985:58) or suggestions in "Making Growth Monitoring More Effective" (Tremlett 1985:12)). A very useful monograph on Growth Monitoring and Development of Young Children - Selection of Methods and Techniques of Training is currently being prepared by the Jelliffes (1990).

**Participatory training approaches.** Competency-based training, focused on preparing workers for specific tasks in the growth monitoring process, is most effective. Innovative ideas for participatory instruction and on-site practice have been proposed that may assist workers in quickly gaining the skills and understanding they need. Suggestions, for example, have included:

- o **Using pictures of children to illustrate the importance of measuring and completing growth charts and the need to follow growth over time.** Workers can be shown a series of pictures and asked if the children are healthy. They then can be given results of weight or height measurements which, in some cases, disagree with their estimates. As the workers look at the completed charts for these children they can explore what the results mean and discuss why incorrect estimates are sometimes made when growth monitoring information is not available (Griffiths 1985:59).

- o **Holding practice sessions during which health workers all weigh or measure the same child or object and then record the results.** The answers can be compared and the common errors that lead to variations in results discussed (Griffiths 1985:59). Simulated use of actual equipment is an important training strategy. Supervision and monitoring of the same technical skills should continue on the job (Jelliffe and Jelliffe 1990).
- o **Using role playing to teach communication techniques and problem solving skills.** Health workers can practice interviewing and using visual aids for teaching purposes. They can role play act discussing unexpected results and possible dietary changes with a worried mother, or reasoning with a father who objects to his wife and child's attendance or with an elder who doesn't see why the village council should support the projects. Often the exercise is particularly useful if it involves changing roles and thus experiencing problem situations from more than one perspective (Griffiths 1985:60, Jelliffe and Jelliffe 1990).

Providing workers with the skills for practical and effective follow-up has been suggested to be of key importance. Workers, for example, need to know what concrete and feasible steps they can suggest for the improvement of the diets of young children and where the mother can be referred if medical assistance or supplemental foods are necessary (Gopaian 1987).

### **Protocols and the Supervision Process**

**The development and use of protocols.** Growth monitoring and promotion contains at least five discrete tasks: motivating, weighing, recording, interpreting, and taking action (Jelliffe and Jelliffe 1990). Many project reviewers have emphasized the importance of developing and using "protocols" or performance guidelines. Those guidelines divide the growth monitoring process into tasks such as those listed above and clearly describe the specific behaviors or actions that need to be completed at each step. They may be developed initially for a variety of purposes, such as 1) for training, 2) to serve as checklists for supervisors or workers, or 3) to serve as tools for systems analysis, project monitoring and assessment. Once developed, they can be extremely helpful throughout the training, implementation and evaluation process.

The Primary Health Care Operations Research Project (PRICOR II) has developed a detailed Primary Health Care Thesaurus that outlines "protocols" that can be used in a systems analysis of selected primary health care tasks. An excerpt from the Thesaurus section focusing on the growth monitoring activity is presented in

the first "PRICOR Report" (1988a), along with discussion concerning how it has been used to pinpoint problem areas in growth monitoring procedures in Zaire that need further exploration. (See the section on research methods for further discussion of this instrument.)

**The importance of systematic supervision.** Effective supervision is a key aspect of successful growth monitoring projects, and yet it is very seldom mentioned. A presentation of "Some Lessons from India" describes important features of effective supervision in the Tamil Nadu Project, including an emphasis on technical rather than administrative matters, the use of checklists of tasks (much like the protocols described above) during supervisory visits, and direct feedback to workers so they immediately understand where their performance is deficient and needs extra attention. Supervision is not restricted to the health center only, but extends to the household level "which is the nodal point of mother-worker interaction." Supervisors are in turn overseen by higher level instructors, who are also guided by a clear cut methodology and set of objectives (Bhan and Ghosh 1986:6).

## **Conclusions and Recommendations**

### **1. Health worker inadequacies and possible training strategies.**

**Education and training in growth monitoring should be strengthened, both in schools for health professionals and in sessions for orienting front-line workers.** High level health professionals often have little understanding of the interaction between malnutrition, growth failure and infection and the major role it plays in decreasing chances for child survival. Educated to play a curative role, physicians often fail to use growth monitoring as a tool in their own practice or to review and act on growth measurements collected by workers under their supervision. As a result, lower level workers often experience morale and attitude problems. These workers may also lack many of the needed technical skills for successfully completing growth monitoring tasks. Revision of growth- and nutrition-related curricula in medical, nursing and auxiliary schools is essential, as well as the development of competency-based training programs for front-line workers.

**2. Protocols and supervision.** The use of protocols that divide the growth monitoring process into discrete tasks and specific actions to be performed should be considered. Once developed, they can be extremely helpful throughout the training, implementation and evaluation process. Supervision systems that use checklists of this type and provide direct and concrete feedback to workers on how they can improve have been found to be quite effective.

### III. Strategies for Promoting Effective Individual and Community Participation

#### Issues for Project Design and Implementation

How can growth monitoring projects be designed to better encourage family and community participation in all stages of the growth monitoring process?

What roles might most effectively be played by mothers, other family members, and the community?

#### Interactive Growth Monitoring and Promotion

The interactive approach. Nutrition surveillance, as mentioned earlier, focuses on the community or population as a group, and is usually based on anthropometric grading of nutrition status. It doesn't involve the mother, and measurements may take place quite infrequently. Growth monitoring and promotion, on the other hand, is focused on the individual, is usually based on weight change, and is greatly enhanced by the mother's and community's understanding and participation. Contacts must be regular and relatively frequent for it to be effective. A recent summary of "Issues in Growth Monitoring and Promotion" (Yee and Zerfas 1987) emphasizes that in "interactive" growth monitoring, the mother should, if possible, have control over the process. Important features of a truly interactive approach include:

- 1) Allowing the mother to keep the card, and encouraging her to interpret her child's growth and act on the results
- 2) Basing interpretation and action on weight change
- 3) Weighing frequently, as often as every month or two, if feasible (Yee and Zerfas 1987)
- 4) Feeding back monitoring results to the mother immediately, so she can take effective action and see the impact of her actions (Hendratta and Rohde 1987:6)

The extent to which field projects have actually adhered to this approach will be explored in the following sections.

**The location of project activities.** Traditionally, growth monitoring activities have been clinic-based. In recent years, however, a variety of arrangements have been employed in different settings. Activities have been 1) home-based, 2) community-based (using weighing or rally posts), 3) mixed facility- and home-based, and 4) mixed campaign and facility-based. The choice depends on the structure of the existing health system, the purpose of the monitoring initiative, and availability of community and health center workers and other resources (NCIH 1987:3). The accessibility of the population varies with the type of community and terrain, the distance between dwellings and the state of roads and paths. These factors may greatly affect whether mothers are able to attend clinics and whether community health workers can easily make home visits (Jelliffe and Jelliffe 1990). An interactive approach to growth monitoring is more successful if monitoring either takes place in the home or is community-based rather than conducted at health facilities, but community and health system characteristics influence how easily this can be arranged.

**Frequency of growth monitoring sessions.** Some programs have found it works best to weigh all the children enrolled in the program every month, while others, finding this approach too labor intensive, have opted for less frequent monitoring of all children, with monthly follow-up of high risk cases. In the Applied Nutrition Education Program (ANEP) in the **Dominican Republic**, for example, all children up to 5 years are weighed at home every 6 months by community promoters and then high risk children are weighed at home on a monthly basis in order to provide more frequent attention and intensive counseling (LTS 1988:2).

### **Involving the Mother and the Family**

**Reaching the most vulnerable children.** One of the most striking and disconcerting observations time and again in field reports is that monitoring activities do not reach those who are poorest and in greatest need. Non-participants are often the most disadvantaged in the community (Vibro 1985). For example:

- o In **Indonesia** the coverage of children by UPGK growth monitoring activities is relatively low (40-50 percent) and unfortunately those involved are often not the poorest or most in need of assistance (UNICEF 1986d:47).
- o The Comprehensive Rural Health Services Project (CRHSP) in **Ballabgarh, India**, determined that the children of the neediest families who are at highest risk for growth faltering and malnutrition are the ones least often covered (FIW 1985:129).

- o The baseline survey for the Integrated Child Development Services (ICDS) project in India indicated that 65% of the malnourished children under three were not being reached by the anganwadis (local women workers) (Anderson 1986:2).

**Costs of participation.** It is not only apathy or social "backwardness" that is to blame for the mothers of the children most in need not seeking care. As personnel from CRHSP in India suggest, the costs of participation are often an important factor:

"...these mothers cannot afford to come to the health center because of the "hidden costs" of the so-called "free care." Most of these parents are daily wage laborers, hence if they do not report for work early morning to enroll themselves, they are deprived of that day's work and therefore do not get paid. To avail of our "free care", they lose a day's wage, thus actually paying many times more than they would if they went to a private practitioner" (FIW 1985:129).

A recent examination of "Time Costs and Time Savings to Women of the Child Survival Revolution" (Leslie 1987) reports that many reviews of growth monitoring field projects discuss the problem of underutilization and the need to take time costs to mothers of transportation and waiting into consideration (Gopalan and Chatterjee 1985, Yee and Zerfas 1987:9). Some reviews mention other less often considered non-monetary costs such as energy (carrying a heavy child) or embarrassment (no beautiful dress for the child, or being treated as ignorant) (Tremlett 1985:14).

Unfortunately, however, these studies provide no specific information on how long traveling and waiting time tends to be, nor do they discuss whether these or other costs are considered to be important deterrents by the women affected. Many reports do suggest, however, that time costs are a limiting factor and that thus village-based or better yet, home-based growth monitoring is more successful in increasing coverage (Leslie 1987:23). A recent review prepared for UNICEF of four successful growth monitoring programs in India found that village-based approaches achieved only about 50 percent coverage, while home-based monitoring is necessary to achieve the desired 80-90 percent coverage and to reach the very young and often the most needy (Bhan and Gosh 1986:3).

**Incentives for participation.** Suggestions for increasing participation are varied and, at times, quite ingenious. Ideas, for example, include:

- o Minimizing waiting by improving "lines of flow" in monitoring sessions
- o Taking clinics to the people so they don't have to wait

- o Holding sessions when people can come, such as in the morning before they go to work
- o Using waiting time constructively in group discussion
- o Holding small clinics or sessions in poorer areas so the disadvantaged are not shamed away from clinics in richer areas (Tremlett 1985:15).

Well-designed incentives have been found to increase participation (and morale) in some projects:

- o In **Tijuana, Mexico**, for example, certain clinics award mothers with lottery tickets for attending weighing and well baby sessions and for following recommended actions so their babies gain weight. Drawings are then held each week for groceries. An evaluation after several months showed a 25 percent average improvement in the weight gain of babies in participating centers (Elder 1988).
- o In the **Philippines** mothers were given polaroid photos of themselves and their babies when they followed desired practices and their babies gained weight (Elder 1988).
- o Other projects distribute cards that are marked at each session mothers attend and that, when completed, can be presented to local merchants for prizes. Small fairs or bazaars have been organized at the time of community-based sessions, and some local groups have found it affective to schedule monitoring activities on market days (Griffiths 1985:49-50).

While a few studies (such as one of the program in **Tijuana, Mexico**) have measured the results of efforts to provide positive reinforcement, project planners suggest that much more needs to be learned about incentives and their effects (UNICEF 1986d:31).

**Who should keep the growth charts.** One quite effective and simple incentive is to give mothers their children's growth records to keep themselves. There is general agreement that mothers, rather than health personnel, should keep the cards or charts. This helps emphasize the fact that growth monitoring is centered on the child and the family and also reduces the health worker's burden while ensuring continuity if a family moves or changes providers (UNICEF 1986d:24). Projects have reported that mothers' enthusiasm and participation in the monitoring process increase when they are given the growth cards. The fact that they are entrusted with the cards indicates clearly to mothers that they are responsible for their children's health (Griffiths 1985:50).



Opposition to this policy has come from some health workers who fear that cards will be soiled or lost and believe that the records are, in any case, the clinic's property and responsibility. The major criticism, that charts will be lost, has not been substantiated. For example:

- o A survey in the Tamil Nadu Project in **India** determined that only 18 percent of the cards were lost, and 67 percent of the mothers brought their children's records to the health center (UNICEF 1986d:24).
- o A study of four under-fives clinics in **Africa** showed an average loss rate for home-based records of eight percent (Griffiths 1985:50).
- o A project at USC Baguio in the **Philippines** reported that while some programs had problems with mothers forgetting their cards, only a remarkably low 1.05% of the over two thousand mothers they serve regularly forgot to bring their records, a low rate that organizers attribute to their educational activities (UNICEF/Manila 1983).

Some organizations use a dual card system, with one for the mother and one for the clinic, but this greatly increases record-keeping costs and workload. The Ten Model Counties Project in **China** used a dual system in one of its pilot projects, but didn't recommend the system for the large scale program (UNICEF 1986d:24). Certain experienced project planners, however, believe that completely eliminating health center records such as these would be unwise, as they are important for project evaluation and for pinpointing children who have serious problems and yet do not return for follow-up. The question of whether records are worth the extra time and cost to maintain must be addressed by each projects. It is most important, in any case, that the primary records remain the property and responsibility of the mothers (Griffiths 1985:50).

**Training mothers to interpret results.** Further involvement and commitment of local mothers may be achieved by training them to interpret and then act on monitoring results themselves.

Certain projects have reported that mothers have major difficulties in understanding the charts and what they mean. In one project in the **Philippines**, for example, only two out of ten mothers interviewed could plot points, identify levels of malnutrition and explain the implications of weight gain and loss for child health (UNICEF 1983/Manila:10). A study of a small sample of mothers in the RUHSA project in **India** indicated that only 15 percent of the mothers were able to explain the use of the charts, and these were literate mothers (FIW 1985:65). In other projects, results are more encouraging. Over 50 percent of mothers questioned in

clinics in central **Ghana**, for instance, were able to interpret the meaning of dots on the charts, the reference lines and their children's weight curves (Lovel et al 1985:4).

Some experienced commentators have suggested that mothers' success in interpreting and using the charts may not depend so much on literacy as on providers' interest in sharing information with people and in investing time necessary to orient mothers properly (Tremlett 1985:7 and UNICEF 1986d:8). Small schemes that are "community supportive" have often had good success in teaching mothers to interpret and understand results (Lancet 1985:1338).

**Mother-to-mother approaches.** A few groups have experimented with approaches that encourage mothers to take complete responsibility for weighing their own children and following through with appropriate actions. Jon Rohde, for example, describes a typical scene in **Haiti**, where mothers meet in small groups in their villages or on hillsides nearby and weigh their own children, mark their own growth charts, and share with each other practical suggestions for fostering growth and taking advantage of PHC services when necessary. He suggests that this movement, which has been tried for some time in **Indonesia**, is now spreading to many regions of the world (FIW 1985:85). When successful, this approach can do much to empower women, giving them the tools to begin to control and improve their own and their children's lives. Even when monitoring activities are not completely in control of community women, strategies which enable mothers to support and share growth and nutrition-related knowledge with each other have proved to be highly beneficial.

**Roles for other family members.** It is important to consider what roles other family members can play in growth monitoring schemes and what strategies will work best for securing their involvement. The child-related tasks performed by different family members vary across cultures and even among families. In many societies, for example, mothers feed children and attend to their health needs, but fathers make decisions about what or how much food is purchased and whether outside assistance is sought when their offspring become ill (Nutrition Communication Project 1989:32). In certain cases grandparents play key roles in various aspects of child care (UNICEF 1987c:27). Older siblings may provide essential assistance, particularly in large families, in caring for and feeding younger brothers and sisters. In some cases children have been even taught to monitor their younger charges' growth (Jelliffe and Jelliffe 1990). It is important to consider how to reach and involve all family members when campaigns are planned.

## Involving the Community

**Cultural differences that affect community involvement.** The types of community participation that are most successful and what techniques work best for mobilizing support vary. In some societies group support for needy members may be common, in others it may not be. In certain cultures group discussions are well accepted and a comfortable forum for learning and expressing opinions while in others an individual approach is more successful. As mentioned earlier, local perceptions of growth and its relation to health and nutrition may differ also. Variables such as these should influence the choice of nutrition education strategies.

**Community preparation - the first step.** Community sensitization to the importance of growth for health and development is the initial step necessary for increasing involvement. Some governments have developed systematic strategies for involving their populations. In **Thailand**, for example, the National Development Plan has identified "basic minimum needs of Thai people", which can assist communities in identifying and solving their own social problems. Nine of these basic minimum needs focus on families consuming adequate foods to maintain healthy bodies. The "basic minimum needs" have been used as tools to assist local people in performing their own "community diagnoses". An assessment in one pilot province led people to discover that 80% of the problems they identified could be solved with existing community resources (FIW 1985:117).

In some projects mass media approaches have been used to increase mass awareness of the growth problem and create a demand for its solution. In **Ecuador**, for example, the PREMI program decided to increase the focus on growth monitoring by organizing a massive campaign to weigh all children under two years of age. A poster was developed and displayed at all health centers to guide workers in conducting the three-day campaign. Extensive coverage in newspapers and other media brought the issue of malnutrition to national attention. The campaign was successful, with more than 60 percent of all children under two weighed, and helped insure that growth monitoring activities were institutionalized on a national level (Mothers and Children 1986:5).

As community leaders and local families begin to see the strategic importance of growth for their own wellbeing and development, mobilization of support for a wide range of program activities becomes more feasible.

**Community roles in project planning.** Community involvement is often enhanced if participation begins at the early stages of project planning. Community members should definitely be consulted when potential program strategies are examined, and in some cases can become active partners in the planning process:

- o In the Applied Nutrition Education Project (ANEP) in the **Dominican Republic**, for example, extensive research was undertaken before activities were designed which identified priority health problems and community beliefs and practices affecting them. Mothers in project communities were included in focus group discussions which examined how feeding practices could be improved and provided feedback on potential solutions proposed by project developers (Mothers and Children 1985).
- o In **Thailand**, as mentioned above, communities are encouraged to carry out their own assessments or diagnoses, as an essential part of the sensitization process (FIW 1985:117).

After data from community surveys or assessments is collected, community councils or other appointed groups can play an active role in analysis and in the planning phase that follows (Rueda-Williamson 1986:9).

**Community roles in outreach and mobilization.** Community groups have been involved in outreach and mobilization activities in a number of creative ways. For example:

- o In certain growth monitoring programs in **India** local women's groups have been formed to provide support for the programs. Members take responsibility for five to ten neighboring houses and serve as motivators, educators, organizers and growth monitoring workers for these families. Teachers and their students have also been organized. They have both developed growth monitoring and nutrition components for the curricula and served as motivators and educators in the community (Bhan and Ghosh 1986:7). In **Ecuador** a "Madre Nucleo" (core mother) and five support mothers are chosen to detect children with growth faltering and refer them to trained primary promoters working in the Catholic Relief Services' child survival program (Nutrition Communication Project 1989:34).
- o In **Columbia** and **Brazil** national programs are working with the Catholic Church which, through its national headquarters, informs local parish priests about the program and the support they can provide at the community level. In **Indonesia** special educational materials have been prepared for Islamic leaders which emphasize the importance of monthly weighing and adequate growth. Imams are asked in particular to encourage fathers to be concerned with their children's growth and to participate in the community nutrition activities (Griffiths 1985:49).

- o The National Child Survival and Development Plan being implemented by the Ministry of Health in **Columbia** has an ambitious plan for community mobilization. Organizations collaborating in the effort include the Ministries of Health and Education, the Columbian Institute of Family Welfare, the Red Cross, the Police Department, the Catholic Church, the Scouts of Columbia, and international donor groups as well. A Youth Social Front for Child Survival has been created with ninth graders serving as monitors to assist families in initiatives to increase child survival. Red Cross volunteers, scouts, policemen and nuns will also be trained to work as monitors (Rueda-Williamson 1986:6).

**Community roles in growth monitoring sessions.** Community-based monitoring sessions are often good forums for community education. For example:

- o In **Indonesia** community weighing exercises have tended to attract large numbers of observers. These occasions have been capitalized on as opportunities to increase awareness of malnutrition. Small interest groups have been formed in some villages to consider possible community actions and have triggered numerous community self-help efforts (swadaya) to address problems identified (FIW 1985:7).
- o A growth monitoring program organized by Foster Parents Plan (PLAN) in **Bolivia** uses "Madres Vigilantes" (watchful mothers or guardian mothers) to give vital assistance. They receive one week of training and then, over a period of several months, serve as assistants to PLAN or government health professionals at the weighing sessions. As they learn the various tasks involved, responsibility is transferred to them, until all that is required from the health professionals is simple supervision and follow-up assistance with cases of severe malnutrition (Nutrition Communication Project 1989:7-8).
- o In the Save the Children Project in **The Gambia** women representatives, typically of traditional extended family networks, are elected as Health Board members. Together with a Health Recorder (trained Public Health Nurse) they conduct the monthly weighing sessions in small groups at a village "rally post", usually the home of a volunteer. They also supervise mothers who are rehabilitating their malnourished children (Nutrition Communication Project 1989:10-11).

Community involvement and support is often increased if opinion leaders and local officials actually assist with the monitoring sessions themselves (Griffiths 1985:49).

**Community roles in interpreting monitoring results and taking appropriate follow-up action.** A variety of interesting strategies have been used to assist communities in understanding and analyzing growth monitoring results. For example:

- o The National Family Nutrition Improvement Program (UPGK) in **Indonesia** requires that workers keep rosters which record whether children have gained weight, stayed the same or lost weight, with tallies of numbers in each category. They are also encouraged to make community graphs illustrating the percentage of eligible children enlisted in the program, the percentage of those enrolled weighed during the current month, and the proportion with increases in weight, for use in community planning. The bar graphs are being revised as they have been found to be unclear to some community members (Griffiths 1985:63).
- o In certain programs growth statistics are compiled by plotting all the children's weights on a large chart every few months so that the community can easily visualize progress. If workers also make maps of the community, colored markers can be used to indicate houses where children have gained or lost weight, making it easier to identify problem areas within the village needing special assistance (Griffiths 1985:63).
- o In the **Thai** Nutrition Program village information centers are used to post information from the growth monitoring program. The data indicates which children under five have faltering growth or poor nutritional status or haven't been weighed, which cases involve illness or diarrhea, what interventions have been planned, and which volunteer workers are responsible. This information can be used by mothers and volunteers and is reviewed at the monthly meeting of the village health committee. The committee monitors the workers' efforts and decides what actions to take concerning problems identified by the volunteers (FIW 1985:121).

Growth supportive activities undertaken by communities have been wide in scope, with the focus depending on local resources available and the energy and imagination of the groups themselves:

- o In **Indonesia** and **Nepal**, for example, communities have begun their own supplementary feeding programs for undernourished children. Local foods are purchased using funds collected either from women attending the monitoring sessions or in local meetings. In **Nicaragua** women have worked to obtain free or subsidized food from outside the local area and then contributed it or provided it at cost to families whose children need it most (Griffiths 1985:50).

- o Communities may decide to take action to improve their water supply, housing, education, or income, or to increase food production or raise animals on a collective basis.

As Hendratta and Rohde (1987:6) have observed, "Communities can see change as they improve water supplies or the availability of food to young children and monitor the percentage of children who are growing each month... While nutritional status takes a painfully long period of time to change for the better, even with the best rehabilitation, growth provides immediate feedback. Used properly this feedback is an important reinforcing element of (growth monitoring and promotion)."

Recently a workshop was held for representatives of private voluntary organizations (PVOs) which focused on promising strategies in growth monitoring and promotion. The report from the workshop summarizes a number of case studies presented by participants that are rich with examples of innovative strategies for community involvement (Nutrition Communication Project:1989).

## **Conclusions and Recommendations**

**1. Strategies for involving mothers.** Strategies that involve mothers **actively in fostering their children's growth and reach not just the relatively well off segments of the population, but those most in need, must be considered.** "Interactive" approaches in which the mother keeps the card, interpretation and action are based on weigh change, weighing is frequent, and feedback immediate are most effective. A critical problem in a large number of projects is that monitoring activities do not reach the poorest, most disadvantaged in the community. Costs of participation, including the hidden expenses of "free" services such as transportation, long waiting times and loss of wages are often greatest for those with children at highest risk of malnutrition. Home and community-based approaches and special outreach drives may increase participation of needier groups. Well-designed incentives for attending monitoring sessions and following prescribed actions that lead to continual growth may increase attendance and impact.

**2. Roles for mothers.** Growth monitoring workers should consider **strategies for fostering mothers' participation, ranging from policies as simple as allowing mothers to keep their own growth cards to more fully-participatory schemes in which the mothers themselves actually weigh their own children and offer advice.** Field practitioners, almost unanimously, recommend that mothers keep their children's growth cards, if possible learning to accurately interpret them. Mother-to-mother approaches where women take complete responsibility for weighing their own children and following through to insure their children's growth

are not so common, but results have been encouraging in places such as **Indonesia** and **Haiti**.

**3. Approaches to community participation.** Culturally-appropriate techniques for including the community in all phases of the growth monitoring process should be considered, since enhanced awareness and active local involvement, if properly focused, will increase the project's impact on growth and survival. Effective strategies for increasing community participation are often culturally-specific. The first step is usually community preparation or sensitization. It may include community-level mobilization schemes or national efforts to increase consciousness and support, such as the **Thai** growth-oriented development campaign or the **Ecuadorian** mass media campaign to weigh all children under three. The community can play important roles in project planning and outreach and can participate in the monitoring sessions themselves. Community rosters or graphs that clearly indicate growth progress and pinpoint individual children or village areas that need special assistance may help facilitate community interpretation and use of results. Community activities to promote growth can range from schemes to provide food for malnourished children to efforts to improve water supplies, housing or collectively raise animals or needed crops.



#### IV. Design of Growth Monitoring Technology That Takes Account of Behavioral Findings

##### Issues for Project Design and Implementation

How can growth monitoring technology be designed to be more appropriate, accurate and effective, considering cultural and behavioral findings? For example:

- o What strategies for measuring growth should be selected?
- o How should adequate growth be determined?
- o How can growth charts be designed so they are easiest for both field workers and mothers to use and interpret?
- o What tools are best for measuring growth in various circumstances?
- o How can equipment such as weighing scales, height and length boards, and charts for measuring "thinness" be improved for typical field use?
- o How can problems with estimating age be alleviated?
- o What solutions can be found to difficulties of logistics and supply?

##### What Type of Measure to Select

Nutrition specialists agree that it is practical and effective in most circumstances to use growth data for assessing the health of children under five and planning appropriate follow-up actions. There is widespread debate, however, concerning what are the best anthropometric measures (techniques to measure the body or body parts) to use. Measures that have been commonly employed by community programs include weight, height, and arm circumference. They may be used individually, in combination with age, or in combination with each other. Frequent combinations include weight-for-age, height-for-age, weight-for-height, and arm circumference by itself or in relation to age or age groups (Griffiths 1985:9).

Information provided by various measures. Each of the possible indicators provides a different piece of information concerning the health or status of a child. The WFPHA Growth Monitoring issue paper clearly describes the important differences:

"Weight measurement assesses total body size, arm circumference the size (muscles, fat, and bone) of that area, and height the degree of skeletal development or the amount of linear growth. Measurements of tissue mass (weight and arm circumference) can increase or decrease according to a child's current dietary intake and health status. Weight will fluctuate more rapidly than arm circumference because it is subject to such variables as retention of fluid and time of day. Height neither changes rapidly nor decreases, but will be arrested by long-term deprivation" (Griffiths 1985:9).

**Measurements most commonly used.** As evident from the description above, different measures may provide differing diagnoses. It is important to select the correct combination, depending on the program's purpose. The Growth Monitoring issue paper provides a clear and useful table outlining the advantages and disadvantages of different anthropometric indicators for growth monitoring projects (Griffiths 1985:12-13). Generally weight-for-age is the favored measure for monitoring programs that take measurements frequently and focus on monthly gain, since weight is the most sensitive to changes in food intake and health. Height-for-age and weight-for-height help distinguish between chronic malnutrition and acute malnutrition. Weight-for-height has recently been increasingly supported for use alone in identifying the nutritional status of children in programs that only screen periodically since it distinguishes acute from chronic malnutrition and avoids the problem of estimating age. Arm circumference is sometimes used in programs with few resources as it is simple and easy to measure, but the measure only identifies children with severe malnutrition.

### **Determining What is Adequate Growth**

**Choice of a reference population.** The issue of what growth is adequate and what type of "reference population" is most appropriate for comparison purposes is primarily a technical question, and thus will not be covered in this review. Reference populations that have been commonly used include the Boston or Harvard reference population, Tanner's reference population, and the National Center for Health Statistics (NCHS) reference population. The Growth Monitoring issue paper again, has an excellent and technically correct, yet clear discussion of the issues involved in choosing an appropriate reference (Griffiths 1985:14-20).

**Measuring the growth of breastfed babies.** One issue that has come to the forefront recently concerns whether statistics on average growth collected several decades ago in Western countries when babies were primarily bottlefed are appropriate for exclusively breastfed babies in developing countries. Recent data indicates that breastfed babies grow faster for two to three months and then tend to grow slower than bottlefed infants, even if they receive supplementary foods.

Current standards used may be inappropriate, alarming breastfeeding mothers whose babies seem to be falling below standard, when their children are actually normal. In some cases the faulty results may cause mothers to introduce weaning foods too early or to stop breastfeeding altogether. Studies in **Africa** and elsewhere indicate that development of new growth standards would be useful that would more accurately indicate when these infants' feeding & growth patterns truly become abnormal (Whitehead & Paul 1984).

### **Designing Appropriate Growth Charts**

**Variations in growth charts.** It has been estimated that currently 200 to 300 different growth charts are being used in more than 80 countries around the world. Some are quite similar to the original "Road to Health" card developed by the Institute of Child Health, while others are considerably modified (Jelliffe and Jelliffe 1990). A "situational analysis" of growth charts in the **Philippines** found a wide variety in use there, with the type employed depending primarily on agency affiliation. The proliferation of chart variations tended to create substantial confusion in the field (FIW 1985:105). While it is important to develop charts appropriate for local cultural and program needs, most experienced observers agree that there is a need to coordinate and standardize the systems used.

**Difficulties in using growth charts in the field.** There are a number of common problems in using growth charts in typical field settings:

- o **Plotting and interpretation errors.** Workers in some programs make a high percentage of errors when plotting and interpreting charts. Dots are sometimes not connected, and staff often overemphasize the position of weight dots relative to reference lines, thus focusing on nutritional status rather than trends in weight gain or loss (Tremlett 1985). When the emphasis is on nutritional status mothers feel penalized for past, not easily remediable, setbacks in their children's growth. The emphasis should be, rather, on timely action to curtail current problems as they are detected (Herbert 1987:13).
- o **Inaccuracies in recording weights.** Personnel may round off weight gain in half kilos before entering it on the charts, not realizing that this biases the results toward less improvement in children over one year of age (who shouldn't be expected to gain 300 grams a month) and thus unnecessarily discourages mothers of children with adequate gain (Teller 1986:10, Anderson 1986:2).

- o **Difficulties for non-literate users.** Growth chart presentations are often cluttered and too complex, especially for semi- or non-literate users. Studies have shown that educational level can greatly affect both workers' and mothers' competence in understanding and interpreting results. A survey in **Delhi** and ICDS program areas nearby found that when mothers, anganwadi workers, doctors and other specialists were tested on chart comprehension, those with over class 10 level of education attained an average score of 18.2 out of 22; up to class 5 a score of 9.5 and illiterate respondents only 2.5! This is not surprising considering that the ability to perceive two dimensional representations is not inborn, and that early exposure to pictures, books, and drawing helps in the acquisition of this skill. The fact that anganwadi workers performed significantly better than mothers of the same education level, however, indicates that specific training can assist in overcoming some of the difficulties (Future 1983-4:52-53).
  
- o **Cultural problems.** Failure to consider cultural differences also causes problems. Charts are often printed in the national language when local dialects would be more comprehensible to most users. Colors used for the different growth paths or weight-for-age zones may be offensive or unappealing if local preferences are not considered. In many cultures, especially in rural areas, chronological age is not normally remembered and mothers' estimates may be quite inaccurate.

**General considerations in card design.** Growth monitoring projects have developed a number of remedies for the field problems encountered, some of them quite creative. Adjustments related to the general design and layout of growth cards have included, for example:

- o **Developing durable cards with adequate writing space.** Use of sturdy cards helps prevent loss and damage. TALC has developed a very durable white plastic growth card. Workers with minimal education may write with large letters and so extra space has been added to many cards to give them the room needed.
  
- o **Simplifying presentations.** Many projects have struggled to reduce the amount of information and the degree of clutter on their cards. This is often difficult in "committee" situations where representatives all have ideas concerning what to add (FIW: 111-112). Development of simplified cards has helped address worker complaints that forms take too long to fill out in busy situations, and makes it easier to focus on the data most critical to child health.

- o **Using the local dialect.** Many projects have developed cards featuring information in local dialects that communicates technical concepts in terms easily grasped and remembered by workers and mothers alike. This has been helpful, for example, in the **Philippines** (FIW 1985:99) and in **Indonesia** (Griffiths 1985:27). See an example of the Indonesian growth chart (figure 2) later in this report.
- o **Using local conventions for writing.** In certain Middle Eastern cultures the possibility of orienting the card from right-to-left has been considered. In the **Sudan**, for example, graphs are sometimes plotted by workers from right-to-left, obeying the Arabic direction in writing, even though the standard curves go in the other direction. Those professionals that resist making the reversal argue that mathematics and science is taught in the Middle East using Western orientations. Research is needed to determine which system would be best comprehended by the community health workers and mothers who need to use the charts in the field (Lockwood 1983:23, Griffiths 1985:23).
- o **Selecting culturally-appropriate colors.** Project staff discovered that mothers strongly identify certain colors with different states of health. When field testing was conducted both in **Ecuador** and in Project Poshak in **India**, red, which is often used in Western countries to signal danger, was chosen as the color for health, and yellow and green to represent weakness and illness. The color zones on the cards were modified accordingly, and an evaluation when Project Poshak ended indicated that 84 percent of the workers understood the meaning of the color bands on the charts (Griffiths 1985:22-23, Mother and Children 1986:4). In the **Philippines** project planners decided to use various hues of blue on certain charts (FIW 1985:99) and in **Indonesia** rainbow-colored zones have been used (Griffiths 1985:27).

Pretesting potential card designs is essential for appropriate adaptation to local needs and preferences.

**Criteria for selecting systems for recording the anthropometric measures.**

Experience with a wide variety of types of graphs and charts has led to agreement on the importance of certain technical features. An excellent discussion paper on "Growth Charts" prepared for the UNICEF Global Growth Monitoring Meeting in New Delhi identifies some of the most important attributes of well-designed charts:

- o Linear accentuation should be longest in the vertical scale so the rising curve of growth is easily seen and an inadequate rise quickly spotted.

- o Trend lines should be prominently displayed to accentuate normal, flat and decreasing growth lines. Nutritional categories, on the other hand, should not be emphasized.
- o Narrow lightly-colored or shaded bands can be used to represent a family of curves which show the direction of growth in a normal population. Serious consideration should be given to eliminating clear cut-off lines that are consistently misinterpreted as absolute border lines for acceptable nutritional status.
- o Month labels can be offset so that they appear at the bottom of vertical month lines, making it easier for workers to know where to put the dots, and 100 and 500 gram lines should be clearly delineated, so small gain or loss will be accurately recorded.
- o Month label boxes can rise towards the right side of the chart, so that distance from them to the area being plotted in older children isn't so great.
- o The age range should be limited to children of less than three years. Thus measurements will focus on the period of maximal growth and the months during which growth faltering is particularly common and hazardous, due to inappropriate weaning practices.

(Burns, Carriere and Rohde 1986:2-4)

**Examples of chart designs with effective technical features.** Nothing is better for illustrating appropriate technology than examples of the adaptations themselves. Just a few of them include:

- o **The Road-to-Health and WHO cards.** The best known chart for growth monitoring is the classic Road-to-Health card developed in the Ilesha Clinic in Nigeria by Dr. David Morley. Variations exist all over the world. In certain areas of Southwest Asia for example, organizers adapted the presentation to emphasize a "Road-to-Peace", which was culturally more appropriate (Tremlett 1985). In 1978 the World Health Organization published a model chart with many of the same feature for community use, in an attempt to standardize the chart (WHO 1986:12 and 21). (See figure 1.) The two line design is excellent in many ways, but a common problem has been the earlier noted tendency of workers to focus on the lines as absolute cut-off lines for adequate nutritional status.



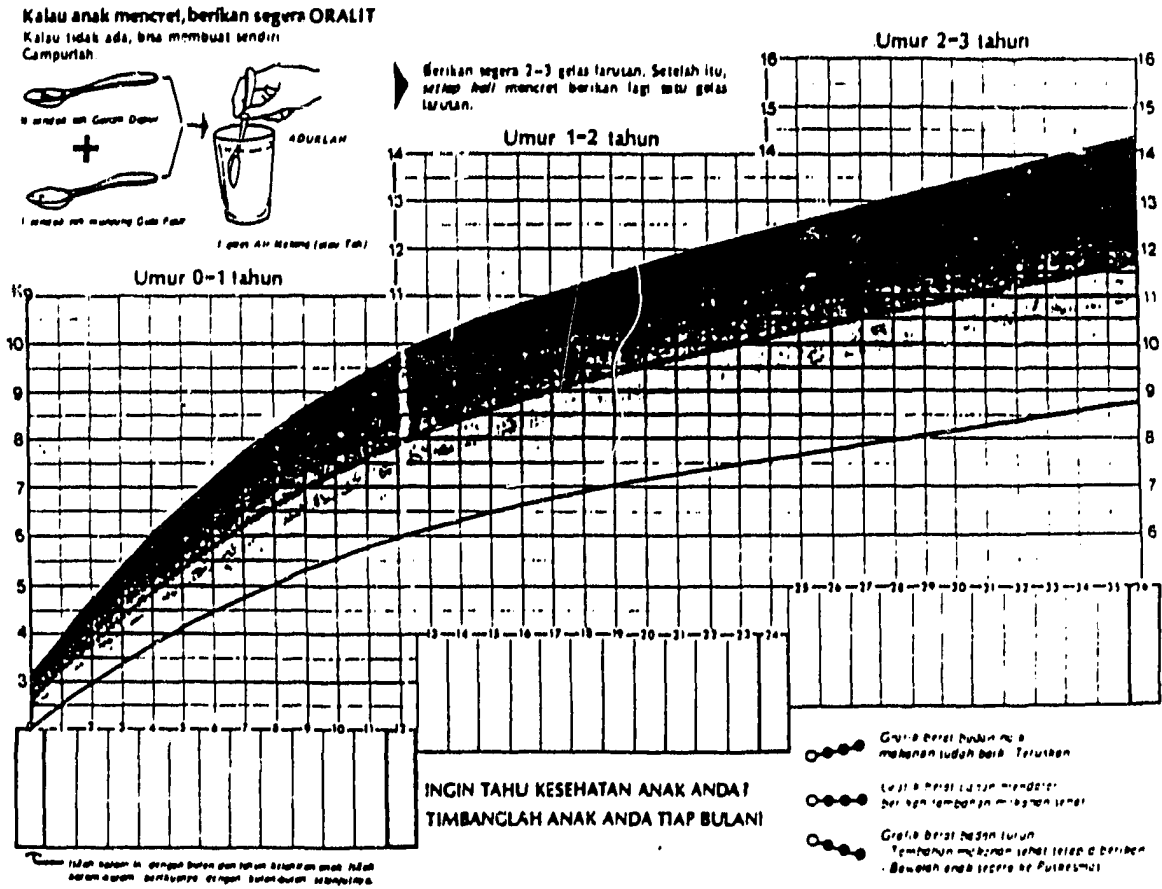
- o **The rainbow chart developed in Indonesia.** A professionally-designed and very attractive chart has been developed in Indonesia that has several quite useful features, illustrating many of the attributes of card design mentioned earlier. Eight growth "channels" printed in pleasing rainbow hues show a range of acceptable patterns in which children may grow. The connected dots in the key at the right hand bottom part of the page emphasize the importance of slope change in growth. Directions and important child survival techniques, such as the use of ORS, are printed in simple words in the local language. The boxes for months are offset a half a space so workers can easily place the dots right above the months. In addition, the kilogram designations and month boxes are respectively staggered progressively farther right and higher up, so they remain close to where the dots will be plotted (Griffiths 1985:25 and 27). (See figure 2.)
  
- o **The bubble chart.** A new "bubble chart" has recently been developed and is causing attention because of its special features which make reading, marking and interpreting data more accurate. (See figure 3.) The chart is similar to others except that there are a series of circles along the horizontal and vertical axis with each circle representing a 100-gram unit. While conventional charts often have only 500-gram increments printed, the bubble chart, with its 100-gram units, adds the precision necessary for accurate detection of adequate upward weight change during the child's second year, when normal gain slows to 200 grams or less. The circles also help eliminate confusion about where the dots should be placed, and the vertical elongation of the chart makes it easy to detect monthly changes in growth velocity.

The chart is being field tested or is in use in **India, Mexico and Lesotho.** Results of the initial experiences with the chart are promising. Health workers and mothers generally find the chart clear and easy to fill in. In a test of alternative charts sponsored by the UNICEF Office in New Delhi the charts with bubbles were the most accurately plotted (80% of the workers could plot bubble charts accurately, compared with a 70% plotting accuracy on charts with lines at 100-gram intervals and 50% accuracy on the conventional chart) (NCIH 1987:3, Griffiths 1987a, Griffiths and Berg 1988). One disadvantage with the innovation is that the opportunity for placing the dots differently depending on whether the weighing has been performed earlier or later in the month is lost (Jelliffe and Jelliffe 1990).



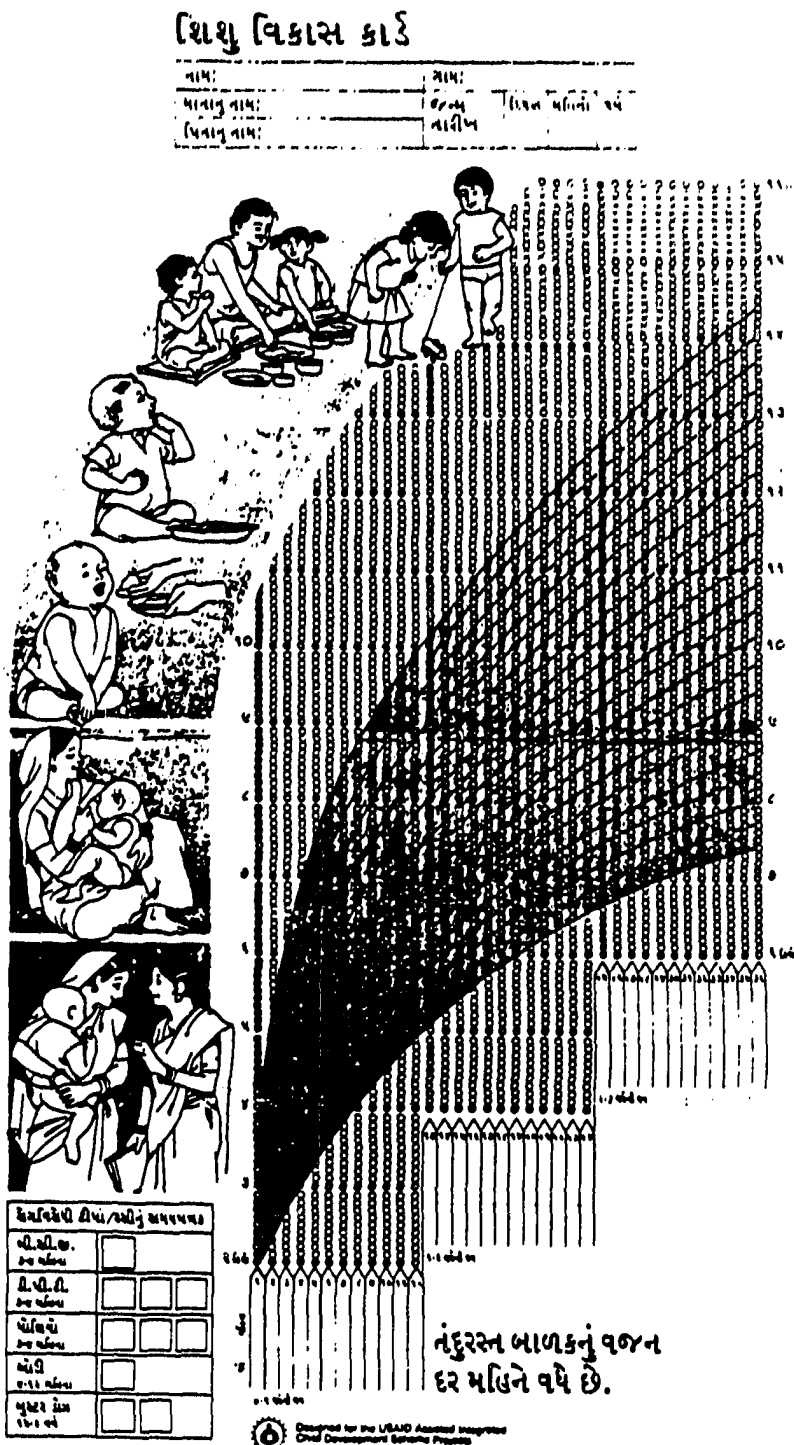
**Figure 2: Indonesia Growth Chart**

Indonesia Growth Chart illustrates shift in placement of boxes indicating Child's Age and Shows a Reminder of the Slope's Meaning in Bottom Right Hand Corner Source UPGK



(Griffiths 1985:27)

Figure 3: The Bubble Chart



(Griffiths and Berg 1988:73)

- o **Charts with a straight baseline and bars.** In **Nigeria** mothers appeared to have difficulties understanding the standard weight-for-age curves. Field testing of charts with a straight baseline and bars indicated that mothers understood them more clearly than charts with a stepped baseline and dots representing the weight (Ladipo and Bankole 1976, Tremlett 1985:18-19). (See figure 4.)
- o **A growth table using horizontal rather than curved zones.** In the **Philippines** project personnel dealt with the difficulties they discovered mothers had in understanding ascending curves and plotting by developing a growth table with zones that run horizontally. The months are listed across the top of the table and under each month is a column marked in kilograms with a range of weights for children of that age. Mothers are taught that if the X's for their children's weights go in a straight line or rise they are gaining weight adequately. (See figure 5.) Workers report that the system is understood by the mothers more easily than weight curves. A study comparing the performance of nutritionists and nutrition aides using the growth table and two growth curves found that one of the growth curves was best for plotting accuracy but that the table was most correctly interpreted and most preferred. After a slight correction the table did as well on accuracy as the growth curve (Griffith 1985:28-29, FIW 1985:94-100 and Lacuna 1979).

**Types of additional information to include on growth cards.** Growth cards can quite usefully include additional information, such as:

- o reasons for special care (locally important risk factors)
- o records of immunizations given, family planning methods used, illnesses and treatments performed
- o reminders of actions to be taken at particular times
- o general nutrition advice, such as how to prepare homemade oral rehydration solutions, how long to breastfeed, or ideas for nutritious weaning foods

Experienced users emphasize, however, that it is important to be very selective in the information displayed or requested, so that the card remains simple and easy to use. Care should be taken, in addition, to be sure that data requested is not embarrassing. Inquiries, for example, concerning contraceptive methods or the name of husband, or questions concerning factors associated with high risk may be upsetting in some cultures (Tremlett 1985:7 and de Barros 1980).

**Figure 4: Two Growth Charts Tested in Nigeria**

Diagram (i) - Straight base line, weight marked with bars

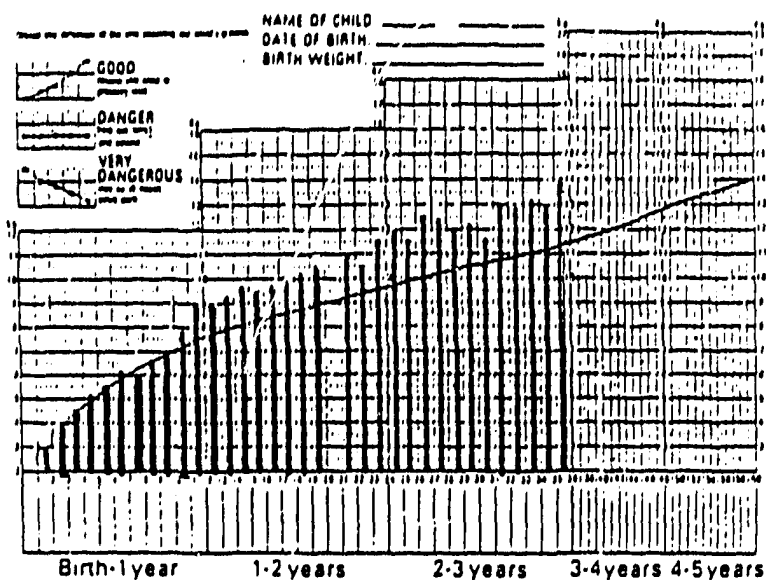
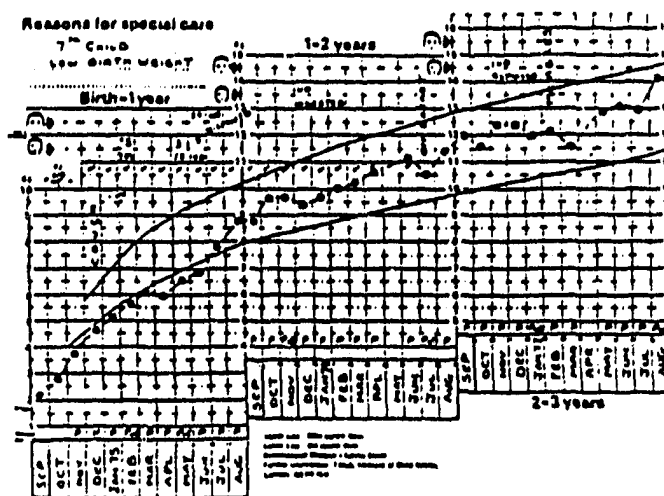


Diagram (ii) - Stepped base, weight marked by dots



(Lapido & Bankole  
in Tremlett 1985:19)

**Figure 5: Philippine Growth Table**

Source: USAID mission, Philippines

**PHILIPPINE NUTRITION PROGRAM**  
**NUTRITION HEALTH CHART FOR BABIES**

Name: \_\_\_\_\_ Date of Birth: \_\_\_\_\_ PROVINCE: \_\_\_\_\_  
MUNICIPALITY: \_\_\_\_\_ BARANGAY: \_\_\_\_\_

MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
WEIGHT (KG)																			
<small>PLPLOT MONTHLY WEIGHT IN TARGET BLUES TO DETERMINE NUTRITION LEVELS</small>																			
<b>GREEN ZONE</b> 1 HEALTHY	3.1	3.8	4.5	5.1	5.7	6.2	6.7	7.1	7.6	8.0	8.3	8.6	8.9	9.1	9.3	9.5	9.7	9.9	10.1
<b>WHITE ZONE</b> 2 MILDLY MALNOURISHED	2.8	3.4	4.2	4.8	5.4	6.0	6.3	6.7	7.1	7.6	7.8	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.5
3	2.7	3.4	4.0	4.6	5.0	5.5	5.9	6.3	6.7	7.1	7.4	7.7	7.9	8.1	8.2	8.5	8.6	8.8	9.0
4	2.6	3.2	3.8	4.3	4.7	5.2	5.6	5.9	6.3	6.7	6.9	7.2	7.4	7.6	7.7	8.0	8.1	8.2	8.4
<b>YELLOW ZONE</b> 5 MODERATELY MALNOURISHED	2.4	2.9	3.5	4.0	4.4	4.8	5.2	5.5	5.9	6.2	6.4	6.7	6.9	7.1	7.2	7.4	7.6	7.7	7.8
6	2.3	2.7	3.2	3.7	4.1	4.5	4.8	5.1	5.5	5.8	6.0	6.2	6.4	6.6	6.7	6.9	7.0	7.2	7.3
7	2.0	2.5	3.0	3.4	3.8	4.1	4.4	4.7	5.0	5.3	5.6	5.8	6.0	6.1	6.2	6.4	6.5	6.6	6.7
<b>RED ZONE</b> 8 SEVERELY MALNOURISHED	1.8	2.2	2.6	3.1	3.6	3.9	4.1	4.3	4.6	4.8	5.1	5.3	5.4	5.6	5.7	5.8	5.9	6.1	6.2
9	1.7	2.1	2.5	3.0	3.2	3.4	3.7	4.0	4.2	4.6	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6
10																			

2 - 3 YEARS BETWEEN BABIES MEANS HEALTHIER FAMILIES

(Griffiths 1985:28)

## Selecting Tools for Measuring.

Methods for measuring arm circumference. Arm bands can be made inexpensively by project staff or purchased. They should be durable and unlikely to shrink or stretch. They can be marked in centimeters, if an exact measurement is needed, or marked with colored areas to indicate acceptable, sub-normal and critical zones. Innovations include:

- o An insertion tape developed by Zerfas (1975) which has a slot into which the end can be inserted, so that the circumference can be read through the window area (Griffiths 1985:36 and Jelliffe and Jelliffe 1990). (See figure 6.)

Figure 6: Zerfas Insertion Tapes



1(a) Standard model.

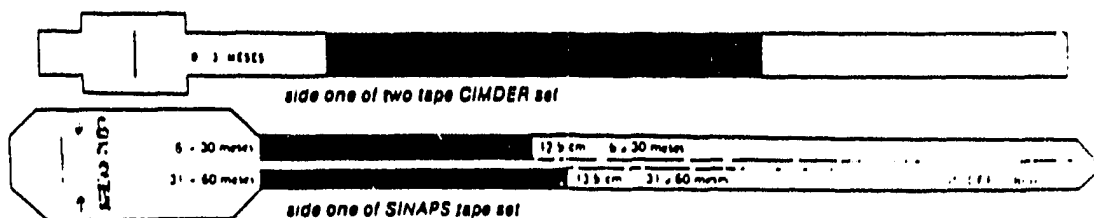


1(b) Modified model, using millimetres and 2 mm intervals, for use for measuring arm circumference of young child or pregnant woman, or fundal height in pregnancy (Available from TALC, P.O. Box 49, St. Albans, UK). (New illustrations to be supplied.)

(Jelliffe & Jelliffe 1990 - draft)

- o Color coded strips that are easily used by non-literate workers, such as the Shakir tricolor tape, and the newer arm tapes that add age specificity to the measurements, such as the tapes used in the CIMDER and SINAPS projects in Latin America (Jelliffe and Jelliffe 1990, Griffiths 1985:36) (See figure 7.)

**Figure 7: CIMDER and SINAPS Arm Circumference Tapes**



(Griffiths 1985:36)

- o Simple methods for assessing the child's upper arm circumference by grasping it with the thumb and index finger and noting the difference between the finger and the ball of the thumb. This easy method, which requires some training, is being tried with workers in India, Bangladesh, and West Africa (Griffiths 1985:36).

**Scales for weighing.** The types of weighing scales used in growth promotion activities around the world can be grouped as follows:

- |                       |                             |
|-----------------------|-----------------------------|
| o Bathroom scales     | o Spring scales with dials  |
| o Beam balance scales | o Tubular spring scales     |
| o Basic bar scales    | o Electronic hanging scales |
| o Improved bar scales | o Electronic walk-on scales |

A detailed field study was undertaken in India to assess scales such as those above, and a useful evaluation technique relevant for use in any project was developed as a result. The major scale attributes that need to be considered and important criteria for each of them are summarized briefly below. Details are given in the discussion paper on "Weighing Scales Design and Choices" prepared for the UNICEF meeting in New Delhi (Burns and Rohde 1986).

**Major issues to consider when choosing a scale for field use:**

- o **Fundamental design**
  - Maintenance
  - Durability
  - Portability
  - Universality
  - Self-contained
- o **Potential for Operator Error**
  - Accuracy
  - Zeroing
  - Parallax
  - Simplicity of use
  - Damping
- o **Acceptability: Scale**
  - Operator-time
  - Mother
  - Child
- o **General**
  - Cost
  - Packaging
  - Potential for manufacture
  - Instructions
  - Ease of training
- o **Potential for Scale Error**
  - Accuracy
  - Linearity
  - Precision
  - Sensitivity
  - Unobvious Damage
  - Fatigue

(Burns & Rohde 1986)

**Assessment of existing scales.** When the criteria were applied to the scales listed earlier, the following assessment was made:

- o **Bathroom scales.** These scales which are found in some weighing projects and most clinics are very inaccurate, but continue to be used because they are so familiar and easy to work with. Their problems of inaccuracy, fragility, poor portability, and parallax (giving different measurements when viewed from different angles) are well known, and they are expensive.
- o **Beam balance scales.** These scales are very accurate, but they are costly, hard to use and cumbersome, and thus not useful for village-based growth monitoring.
- o **Basic and improved bar scales.** Bar scales are widely used in **China, Philippines, Indonesia, Thailand,** and certain parts of **India.** Their assets are that they are locally produced, acceptable and very familiar, but there are problems of accuracy and lack of portability. Improved bar scales are less costly but also less durable, although design modifications to the UNICEF bar scale have eliminated some drawbacks.



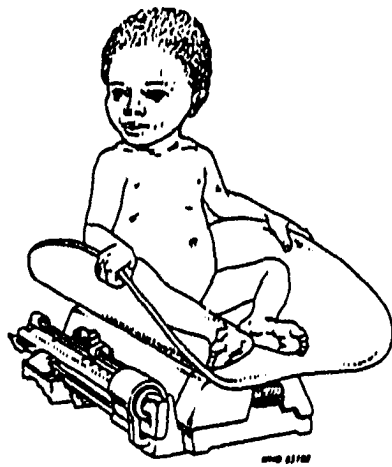
- o **Spring scales with dials.** This growth monitoring scale originally developed by Salter & Co. has recently gone down in price. It has been recommended for use in the ICDS programme in India because it is easy to use and durable.
- o **Tubular spring scales.** The 5 kilogram model produced by Salter/Abbey which can be used for weighing newborns and infants appears to be useful.
- o **Electronic hanging and walk-on scales.** UNICEF is working with various manufacturers to perfect both these types of scales. The U.S.A.I.D. funded Program for Appropriate Technology in Health (PATH) has developed a hanging electronic scale, which is still relatively costly. Production scale-up is expected during 1990. Unfortunately, the various problems associated with hanging, such as acceptability and ease of use, still remain.

The electronic walk-on scale appears to be a very useful solution to the weighing problems in growth monitoring. The prototypes have a rechargeable solar energy battery, a digital reading system, a mechanism so the scale automatically subtracts the first weight (mother) from the second weight (mother and child) to give the child's weight, and are durable, water and dust resistant, and require little maintenance.

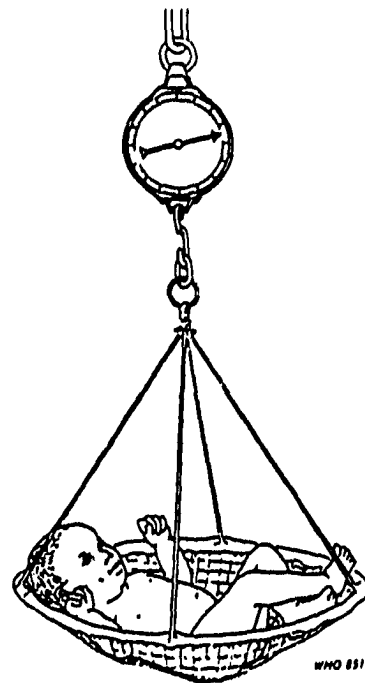
**Other recent developments.** Recently TALC has designed and produced a direct recording spring scale which makes use of a spring which stretches 1 centimeter for each 1 kilogram and is quite accurate between 2-16 kilograms. A special growth chart is placed right in back of the spring, positioned so that the current month is opposite the black arrow. Then all the health worker has to do is place a ball pen through the hole at the top of the spring and make the next entry on the growth chart. The scale is cheap and light, and can be used in or near the home. It is helpful in illustrating to mothers that a change in weight leads to a change on the chart. One disadvantage is that to be effective, special weight charts have to be used in which the kilogram lines are exactly 1 centimeter apart (Morley:1988).

See Figures 8 and 9 for illustrations of some of these scales. Also see "Weighing Scales Design & Choices" (Burns and Rohde 1988) for further details concerning the above assessment. The Issue Paper on Growth Monitoring (Griffiths 1985:37-42) provides another excellent discussion of weighing scale choices, as well as reviewing methods for suspending both the scales and child.)

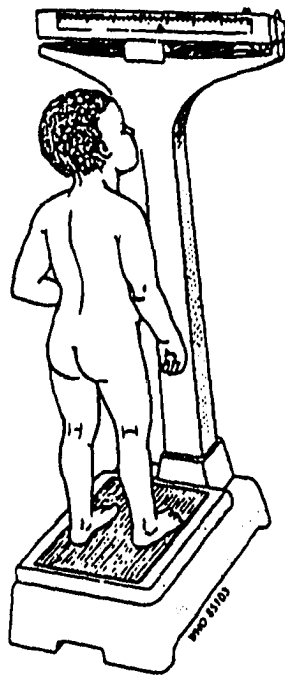
**Figure 8: Weighing Scales**



Beam balance for children under five years old



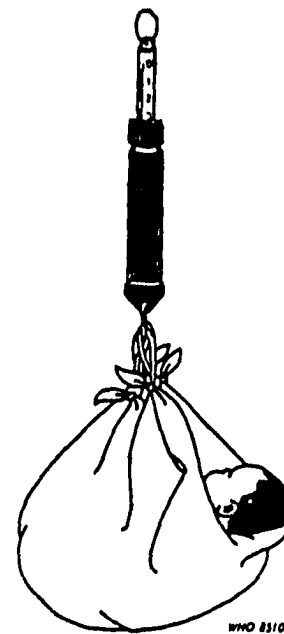
Spring scale with a dial



Beam balance for preschool and older children



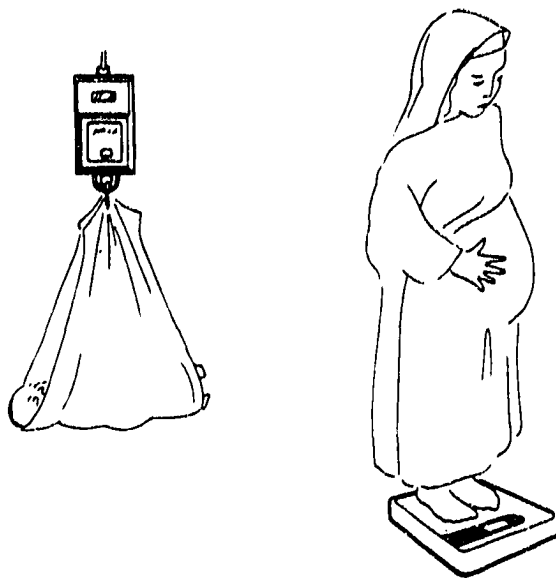
Bar scale and comfortable sling seat for weighing young children



Tubular spring scale for weighing newborns and infants

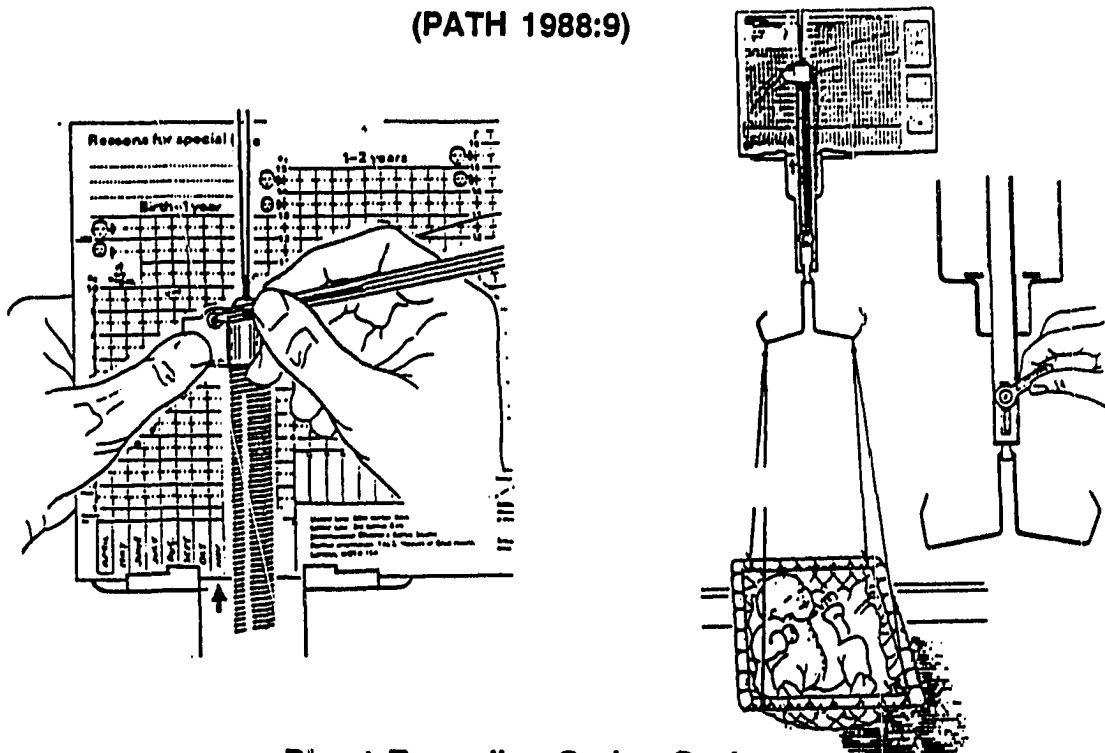
(WHO 1986:22-24)

**Figure 9: Weighing Scales - New Developments**



**Electronic hanging and stand-on scales**

**(PATH 1988:9)**



**Direct Recording Spring Scale**

**(Morley:1988)**

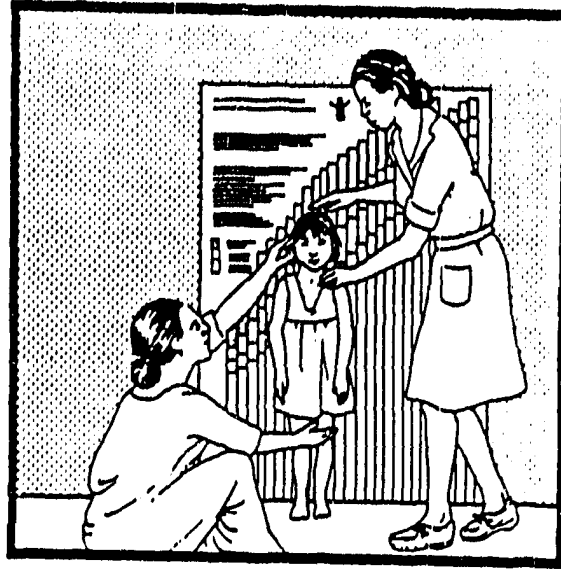
**Tools for measuring height and weight-for-height.** A number of appropriate tools have been developed to address field problems encountered with measuring both height or length, and weight-for-height. Examples include:

- o **Boards for measuring length and height.** Measurement of height or length has been found to be quite inaccurate if a child is simply placed by a wall or in a reclining position and measured by looking at a tape measure behind the head. Several boards have been designed with perpendicular sliding parts that adjust to the child's length to give a more accurate measurement. They can be purchased or made locally (Griffiths 1985:41).
- o **Weight-for-height "thinness" charts.** A quite useful tool for measuring height compared to weight for detecting "thinness" and acute malnutrition has been developed in Nepal by Save the Children Fund and the London School of Hygiene and Tropical Medicine. The original version is a large chart printed on plastic coated paper so it can be folded and easily transported, and then taped to the wall. The chart has a series of columns or bars corresponding to different weights, which are color-coded to indicate nutritional status or risk categories for various heights. The child is first weighed and then stands next to the appropriate bar for a height measurement, which doesn't require plotting or transferring information from other charts (Griffiths 1985:42). (See figure 10.)

A portable "thinness chart" board was developed by Nabarro for use in the field. (See figure 11.) The board was made narrower for easy transport. This alteration made it necessary to place three stacks of shorter sets of bars one on top of another. It used two shades of red as color coding. Field trials of the equipment in Zambia, Tanzania, and Zaire indicated that the three stacks of bars were confusing to workers. Since they did not extend downward, the columns didn't reach the heads of adequately nourished children. The indistinct color coding between the different shades of red was also difficult to distinguish. It was suggested that both sides of the board be used, so that wider and longer bars could be used, and that color coding be improved (Campbell et al 1985).

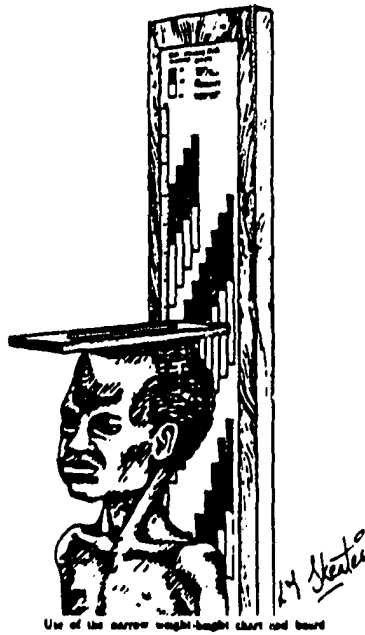
**Figure 10: Thinness Chart**

**Health Worker and Mother Measuring Child on Thinness Chart** Source: London School of Hygiene and Tropical Medicine, London, U.K.



(Griffiths 1985:42)

**Figure 11: Portable Thinness Chart - Weight-Height Chart and Board**



Use of the narrow weight-height chart and board



A series of the narrow Nohara weight-height chart

(Campbell 1985:410)

## **Estimating Age**

Estimation of age for measurements such as "weight-for-age" has proved to be quite difficult in many field settings. A mailed survey of 787 health personnel in 50 countries indicated that "not being able to determine birth month" was the most commonly encountered difficulty in growth monitoring programs, with 78 percent of the respondents reporting difficulty in this area (O'Brien 1979, Tremlett 1985:5). An examination of data from the Companiganj project in **Bangladesh** indicated that over-reporting and random error in age was a problem there, as in many other projects, with the degree of over-reporting greater for non-literate mothers who tended to over-report the ages of taller heavier children (Bairagi et al 1987).

Techniques for assisting in age estimation include:

- o **Comparing the child with children whose ages are known.** Mothers can be asked what other children in the village were born the same time as theirs. If some of the other children have known birth dates, this will assist in estimation.
- o **Using developmental characteristics to estimate age.** Charts can be prepared that list development characteristics common at particular ages (e.g. number of teeth, whether the child can sit or walk alone, whether he talks and with how many words). These guidelines can then be used to approximate ages when parents are unsure.
- o **Preparing calendars of local events.** Project personnel can work with community members to develop a calendar listing well known events in the past three to five years, and their exact dates. This aid may be helpful to a mother who doesn't know her child's age but can associate the birth with the time of a local religious celebration, last year's planting season for a certain crop, or a well-remembered disaster.

(Griffiths 1985:43, Tremlett 1985)

## **Problems of Logistics and Supplies**

Budgetary and logistical constraints resulting in insufficient or unpredictable supplies of growth charts, scales that are broken and never repaired or replaced, and other similar difficulties may pose greater problems for monitoring growth than lack of training or poor design of charts or equipment. A review of growth monitoring projects in **India**, for example, indicated that efficient supply, maintenance and replacement of growth cards, weighing scales and other items was critical. In some areas it took months instead of days to repair or replace broken scales (Bhan and

Ghosh 1986:10). A "situational analysis" of growth charts undertaken by UNICEF in the Philippines indicated that problems such as inadequate supplies of forms, irregular replenishment, and insufficient numbers of weighing scales were of major importance there also. Staff reported quite often having to improvise charts on any available scraps of paper (UNICEF 1983/Manila:7). Investigations such as these are a step toward determining the full extent of the problem, but concentrated efforts to find creative solutions, such as those proposed to improve measuring and charting technology, appear to be few and are badly needed.

### **Conclusions and Recommendations**

1. **Growth chart design.** Growth charts should be 1) simple and clear with adequate writing space for the minimally-educated, 2) use local dialects for written components and culturally-appropriate colors, and 3) contain essential (but limited) health information. Technical features should include 1) designing the longest accentuation in the vertical scale so a rising growth curve is easily spotted, 2) use of narrow shaded or colored bands to show there are many "normal curves, 3) offsetting month labels so they are directly below where dots should be placed, and 4) limiting the age range to three years so the chart focuses on the period of greatest risk for growth faltering. Field reports indicate that errors in weighing, plotting and interpreting charts are common. Cards are often too complex for semi-educated users and lack consideration of important cultural preferences. Design issues such as those listed above are important to consider when exploring potential improvements. It may be that the classic "road-to-health" growth curve is not best for all cultures. Growth tables with horizontal zones and charts with bars rather than dots have been shown to be more easily understood in some societies.

2. **Selecting weighing scales.** Important attributes to consider when selecting weighing scales for field use should include maintenance, durability, portability, acceptability, accuracy, potential for operator error, simplicity of use, cost, potential for manufacture and ease of training. A detailed field study of scales undertaken in India indicates that attributes such as those above are important. An evaluation technique relevant for use in assessing scales in any project was developed as a result (Burns and Rohde 1986). Bar scales, spring dial scales and tubular spring scales were found to be good choices in some settings. The electronic walk-on and hanging scales, currently being developed, should be very useful solutions to weighing problems in the future.

**3. Estimating age.** When determining age is a problem, techniques for assisting in estimation should be considered, including 1) comparing the child with children whose ages are known, 2) using developmental characteristics to estimate age, and 3) preparing calendars of local events that parents can easily associate with their children's births. A survey of health personnel in 50 countries indicates that not being able to determine birth month is the most commonly encountered difficulty in growth monitoring projects. Techniques such as those above have proven helpful in age estimation.



## **V. Behavioral Aspects of Promotional and Follow-up Activities**

### **Issues for Project Design and Implementation**

What are the most effective types of promotional and follow-up activities that can be undertaken in growth monitoring projects?

What behavioral and organizational considerations are important when designing these activities?

How can growth monitoring and promotion best be linked to or integrated with other child survival and primary health care activities?

### **Growth Monitoring as an Action-Oriented Activity**

Many growth monitoring initiatives have concentrated on increasing coverage and improving the mechanics of weighing and charting, only to find that their efforts remain weakest in the critically-important area of follow-up. A description of the problem in one large scale weighing operation graphically illustrates the problem:

Critics have noted that in many villages, benefits of weighing is not yet evident. Small wonder when mothers are lined up, more than one hundred at a time, hand their child to a health worker who mysteriously records some numbers or lines on the weight card and hands card and child back, hurrying on to the next in line (FIW 1985:90).

A recent survey of growth monitoring projects and related training activities found that training related to follow-up was poorest, providing just one indication of why this is often the weakest aspect of the growth monitoring process (Lancet 1985:1338). As mentioned in the introduction, growth monitoring by itself, however effectively executed, will not result in nutrition improvement. It must always be followed by action to address the problems that have resulted in faltering growth. Thus, as one reviewer observed, "Growth monitoring is not even a means to an end; it is only a means to a means. In this respect, it stands on an entirely different footing from the rest of the items in GOBI" (Gopalan 1987).

As a strategy to facilitate improvements in nutrition and health, growth monitoring can have an important impact, but only if follow-up activities are skillfully designed to address the causes of poor growth and development. Growth monitoring programs with poorly designed action components may be a very poor use of resources to improve child health (Nabarro and Chinnock 1988:946). Thus the choice of the range of promotional, preventive and curative activities that follow monitoring is a critical aspect of program design.

Many follow-up activities have been proposed by experienced professionals. Some of the most important will be reviewed below, as well as the behavioral and organizational factors that appear to affect their success.

### Nutrition and Health Education

Growth monitoring projects should have educational components, whether or not there are resources for health care follow-up or feeding. Nutrition and health education can gain in efficiency and effectiveness by the simple targeting that growth monitoring makes feasible. As Marcia Griffiths (1986) has observed, "when advice is related to growth monitoring results, it is less abstract than when it is offered as a standard list of 'dos' and 'don'ts.' Growth monitoring also allows advice to be targeted in terms of the time to give advice and what advice to give. It ensures that mothers will receive relevant advice when they need it most--that is, at the time a problem has been spotted."

One major pitfall in growth monitoring projects, is a tendency to focus on the wrong age. Many projects enroll children at ages three and four, when they are past the period of early growth faltering and often are already severely malnourished. As Hendrata and Rhode (1987) have observed:

...those programs said to have failed often attempted to rehabilitate such children with nutrition advice alone, an unlikely outcome in impoverished, frequently infected and generally resource poor communities. The important operational implication of a promotive strategy is the need to start at a very early age, preferably at birth. During the early months when most children grow well is the ideal time to communicate the importance of growth and the positive message and encouragement for good growth seen in each child... Here is when we can "catch the mother doing something correct" and give her positive reinforcement instead of the usual negative punitive message delivered for having failed once again. Then, at the first sign of non-growth, the mother will be far more receptive to messages and ideas on how she can restore growth in her child whom she has seen growing each month since enrollment in the program.

Families can respond to problems of faltering growth by reallocating their own resources if they are not in dire need and are properly motivated, presented with clear and feasible alternatives, and have played a role in deciding what new practices they will try (Griffiths 1985:51).

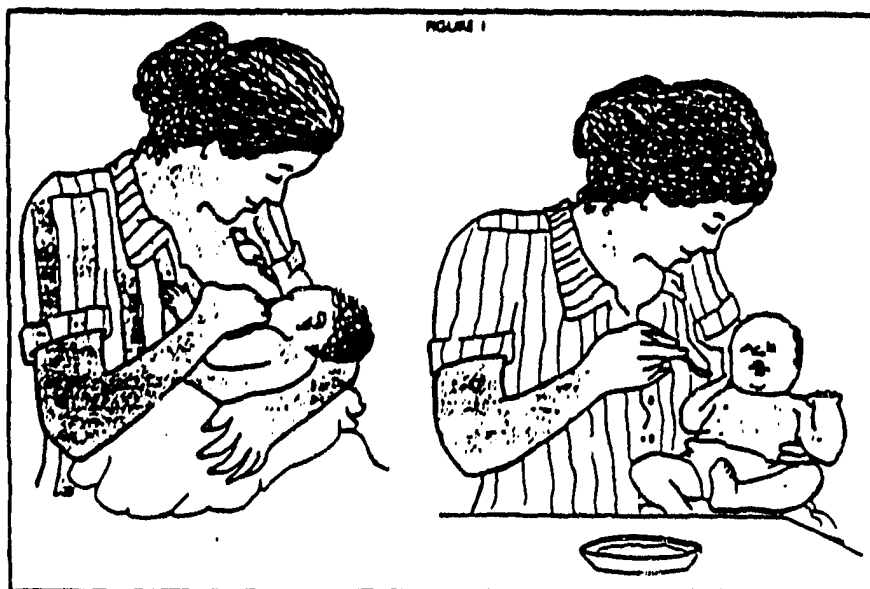
**Educational techniques used in growth monitoring projects.** Educators have experimented with many innovative and effective techniques and strategies for promoting good growth, just a few of which reviewed below.

- o **Growth charts as an educational tool.** A number of monitoring projects have experimented with altering growth chart designs (e.g., using different colors, charting methods, nutritional zones) to facilitate understanding on the part of users, including workers and the mothers themselves. (See the discussion in the previous section.) In addition, simple but important nutrition advice is often included on the cards. Presentations may give pictorial and simple written instructions concerning breastfeeding and weaning practices, preparation of oral rehydration solutions, or immunizations needed. (See figure 2 presented earlier for one example.)
- o **Community participation in message design.** The Nutrition Communication and Behavioral Change Component of the UPGK Project in **Indonesia** did some pioneering work in developing strategies for involving the community in nutrition message design. Small but representative samples of households tested, modified, retested and commented on potential messages for promoting changes in feeding practices. This activity and other components of the formative evaluation process led to the design of a number of practical and effective educational messages aimed at mothers of children of various ages with specific conditions (Griffiths 1987b:4-5).
- o **Flip charts, action posters, and counseling cards.** Once educational messages are developed, a variety of strategies may be used to present the information. The **Indonesia** project developed flip charts with messages for mothers with children with specific ages and problems, as well as action posters. These are sheets given to mothers at the weighing session with pictures and a self-evaluation form focused on actions they are to attempt to implement at home (Griffiths 1987b:6). ANEP in the **Dominican Republic**, PEM-PAAMI in **Ecuador**, and ICDS in **India** attempted to make the individual counseling materials more flexible, and developed counseling cards which have proved quite effective. Each card has written material on one side and has a picture of the action being recommended on the other. It clearly specifies the child's age and the condition for which it should be used. The worker picks out one or two appropriate cards to use in each session, adapting the message after exploring the mother's individual situation (Griffiths 1987b:7 and LTS 1988:3-12). (See figure 12.)

**Figure 12: Counseling Cards**

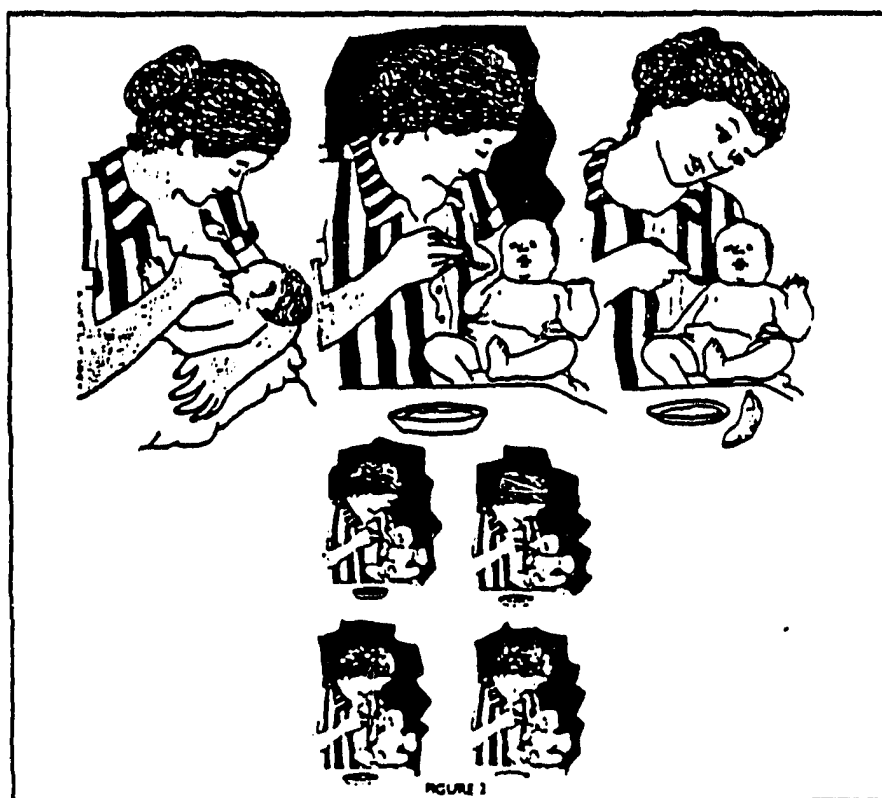
**Card to use with mother whose child is 5-8 months of age and has gained weight**

**(Congratulating and counseling to continue breast-feeding and feed a thick food 3 times a day)**



**Card to use with mother whose child is 5-8 months of age and has not gained weight**

**(Counseling to continue breast-feeding, give child four meals a day and snacks such as fruit between meals)**



**(Mothers and Children 1985)**

- o **Pictures and stories about children and their growth.** Several projects have used illustrations or photos of children along with stories to present the relationship between illness and growth and between food consumption and growth. A nutrition project in **Morocco**, for example, uses a story which compares the life of Rachid, a sick, poorly nourished child, and that of Ahmed, a healthy and lively child. After relating the story, the health worker asks the mothers to discuss the growth patterns and likely diet and behavior of the two children. Then the mothers are questioned about their own children. Other techniques that have been used include 1) asking mothers to create stories about children from the community, 2) showing photos of one child that is badly malnourished and later improves and then posing questions concerning why the child might have gotten better, or 3) using taped, open-ended stories to explore the ideas most often questioned by mothers during individual counseling (Griffiths 1985:53-55 and LTS 1988:7).
- o **Games, plays, songs, slogan competitions.** A game board has been developed which is like a growth chart. It shows players how to complete charts and what an ascending and descending growth line means in terms of health and growth. Two teams play with markers representing two children and draw cards which state the children's ages, weight and illustrate how they "grow", depending on what happens to them. The thin child finally dies during the last month (Griffiths 1985:53, Srinivasan 1982). The Tamil Nadu Integrated Nutrition Project and Child In Need Institute in **India** have made very effective use of local folk theatre, singing during marriages, peep shows, and slogan competitions (Bhan and Ghosh 1986).
- o **Video tapes and various mass media approaches.** Face-to-face education can often be successfully reinforced by radio spots or even radio courses such as one developed in **Honduras** that mothers were encouraged to listen to, receiving diplomas for following all the programs and completing a simple "exam" (Booth 1985). A study in the **Philippines** showed that villages with behaviorally designed video tape modules and CHWS trained in communication skills were three times as effective in promoting the sales of a nationally produced weaning food as volunteers with no communications training or modules. As a result, volunteers were trained and equipped with video modules in the program areas (FIW 1985:103).

- o **Mother-to-mother exchanges.** Sometimes the simplest educational techniques work the best. In central **Ghana** project personnel found that organizing weighing sessions to allow for group discussions among mothers, where they could exchange ideas on good food practices, was one of the most useful educational strategies (Lovel et al 1985:4). In **Haiti** one project grouped mothers of malnourished children with women who had successfully brought their offspring through difficult periods and could give support and advice to the others (Alvarez and Heurtelou 1982). Ideas provided during these mother-to-mother exchanges, if individuals are properly grouped and motivated, are usually some of the most feasible and culturally appropriate.

Marcia Griffiths, as can be seen by the review above, has provided some of the most practical and useful discussions of educational techniques and strategies appropriate for growth monitoring projects. In her discussion of "Using Monitoring Results for Family Education" in Growth Monitoring (Griffiths 1985:51-56) she reviews some basic points about education sessions that are well worth considering:

- 1) Mothers should have an explanation of the results of the weighing or measuring as soon as possible and should leave the session with a clear idea of what they are going to try between the current session and the next.
- 2) Community leaders should be invited to attend the monitoring session or to open an educational discussion.
- 3) The mothers should be engaged in open discussion rather than be lectured to.
- 4) Examples from the mothers' experience should be used to illustrate specific points.
- 5) Mothers with malnourished children should not be singled out or embarrassed.
- 6) Sessions should be brief.
- 7) Whenever possible, visual aids should be used to illustrate the points in the discussion.

## **Preventive and Curative Follow-Up Activities**

As mentioned in the introduction, growth monitoring sessions can provide an excellent forum for various simple health inputs that are often critical for healthy growth. Some of these services are a normal part of the accepted PHC repertoire, and can also be delivered in other settings. Many projects have found, however, that the monthly weighing exercise provides an especially useful opportunity for providing these inputs on a timely basis. Projects have often used growth monitoring sessions to provide:

- o Immunizations for measles, pertussis, tetanus, diphtheria, polio, and tuberculosis
- o Oral rehydration therapy demonstrations and, in some cases, ORS packets
- o Vitamin A capsules
- o Ferrous sulfate preparations
- o Deworming medicines
- o Chloroquine tablets in malarious areas
- o Other minor treatments

(FIW 1985:59 and 88, Hendrata and Rhode 1987:9, Griffiths 1985:47, UNICEF/Jakarta 1986).

**Growth monitoring sessions as an opportunity for maternal care.** Since most children are brought to monthly weighing sessions by either their mothers, a female sibling, or a female member of the extended family, growth monitoring projects offer an ideal opportunity to provide reproductive and pre- and post-natal care to women. In **Indonesia**, as in many other countries, women can obtain birth spacing information and contraceptive resupplies at the village weighing posts. Iron folate tablets are distributed to pregnant mothers in some of the posts. In the Under Six Clinic program in the **Philippines** family planning services are offered to mothers in between weighing sessions (FIW 1985:6-7, UNICEF/Jakarta 1986:13).

**Strategies for effective health care triage.** Projects have experimented with different methods for deciding which of the possible follow-up health inputs should be presented to various mother and child pairs. Some projects simply leave the decision up to the health worker weighing the child, but this staff member may or may not have the skills or time to do an effective job. A number of projects are

beginning to use protocols or treatment guides. These checklists or flow charts prompt the worker on the types of questions to ask mothers with children presenting certain growth problems or medical symptoms, and then suggest the appropriate follow-up actions to take. Jelliffe and Jelliffe (1987), in their new training guide for growth monitoring, present a number of these treatment guides that can be used both in training sessions and later, on the job.

Various strategies have been devised for organizing the weighing sessions themselves so that mothers have an opportunity to receive all the services they may need. In **Indonesia**, for example, weighing posts are set up with five tables, including stops for 1) registration, 2) weighing, 3) recording, 4) education and simple preventive measures (e.g., Vitamin A capsules, ORT demonstrations, iron folate tablets for pregnant mothers), and 5) services such as immunization, prenatal check-ups, family planning, and simple curative care (UNICEF/Jakarta 1986:9-13). Project organizers find that this type of system is effective if workers have proper skills and if the numbers of mothers and children are not so great that contacts are too short and noisy for adequate exchange to take place.

### **Referral to Other Health and Child Care Services**

Provision of basic primary health care services on a "one stop" basis, when possible, can be very attractive to mothers and increases participation in the weighing sessions themselves.

**Referral for medical problems.** Many of the health or medical problems discovered may not be easily treated on site, and thus projects often include referral as one of the range of actions taken. Developing adequate referral strategies and assuring that mothers both go for follow-up and are adequately served, is a challenge in many settings. An assessment of the typical situation in **Indonesia**, for example, found that health centers often did not have enough manpower to adequately supervise the community weighing sessions and that the referral mechanism between the weighing post and health center did not function properly. There were problems related to the skill of the staff in handling the cases referred, as well as financial and management difficulties with the referral mechanism. The report observed: "This lack of adequate back up is one of the most serious problems encountered in the field which threatens the functioning of the whole program. A massive training program for the health center staff and budget allocation to support the necessary treatment...is critically needed. Otherwise, the program will lose its credibility with the people" (FIW 1985:58).



**Referral for child care services and counselling.** Very few discussions in the growth monitoring literature focus on non-medical or nutritional problems in child care as important factors in the failure of some children to thrive. Information from other fields, however, suggest the importance to child growth and wellbeing of such factors such as 1) not having the time to look after the baby well, 2) not having enough knowledge of proper child care techniques, 3) not providing enough loving (e.g. because the child is unwanted or family life has disintegrated), or 4) illness of the mother or other caretaker. Issues such as these are discussed both in a presentation of the growth promotion program in Thailand (FIW 1985:119) and in the Jelliffes' book (1987:43). Possibilities for referral in cases like these need to be considered, along with the standard health-related referrals.

### **Supplementary Feeding**

The issue of whether and how food supplements should be provided in conjunction with growth monitoring activities has provoked widespread debate among practitioners in the field. Experience with alternative approaches show that:

**Growth monitoring and nutrition education without food supplements can make a significant difference in child growth and survival.** One problem is that food supplements can be quite costly over the long term and thus strategies that avoid them, if effective, are an attractive alternative. The Nutrition Communication Behavioral Change Project in Indonesia, for example, focused on altering child feeding and nutrition through growth monitoring and nutrition education, with no provision of food supplements. Extensive research was undertaken in the design phase to determine, with the communities' help, what messages would be feasible, acceptable, and have highest impact on the nutrition and health of high risk children. The education techniques, which have been described in more detail elsewhere, included training volunteer village nutrition workers (kaders) to use guidelines and flip charts with messages designed for specific high risk groups. Audio cassettes, radio spots, and other innovative communication strategies were used as well. Results showed that after the age of five months project children were growing significantly better and that at 23 months they had mean weights almost one kilogram higher than children in the control sample (Manoff 1985, Gibbons and Griffiths 1984:42).

**In some communities lack of food may be a critical problem.** Growth monitoring with nutrition education may not be sufficient to adequately address all the difficulties in situations where food shortages are severe and children do not receive enough sustenance to maintain proper growth. Assessments have shown, for example, that more than 40 percent of the rural households in A.I.D. assisted states in India do not consume enough food to meet the needs of all family members (Anderson 1986:2).

**Growth monitoring and nutrition projects should first explore whether food supply problems can adequately be addressed through activities to improve food production or distribution.** Outside donations of food to families may not be needed if the problems stem mainly from inequitable allocation of food among family members. In certain parts of **India, Bangladesh, and Pakistan**, for example, a measurable bias toward boys in the allocation of food has been found, resulting in a much higher proportion of girl children falling in the severely malnourished category (Behrman and Kenan 1984:22, Ghosh 1986:11, Chen et al 1981). Deep-seated practices may be difficult to change, but strategies should be devised and field-tested that attempt to shift the proportion of foods allotted to high risk groups.

In other cases, the absolute quantity of food may be insufficient, but supplies may be adequately increased through small scale food production (UNICEF 1986d:27). Nutrition projects have undertaken efforts such as the promotion of home-garden and community food production, with emphasis on growing locally acceptable foods not readily available but important to the diet (FIW 1985:97).

**Food distribution should never be the only follow-up activity in growth monitoring projects.** In many projects when underweight children are detected, follow-up consists mainly in the provision of food supplements (Lancet 1985:1337). A recent review of projects in **India** suggests that the emphasis in growth monitoring has too often shifted away from early detection of growth faltering action to identification of children whose nutritional problems are sufficiently severe to merit relief and rehabilitation through feeding programs. Under these circumstances growth monitoring, instead of being an instrument for preventive and promotive health care, becomes a "tool for the implementation of a nutritional policy of brinkmanship" and simply an adjunct to supplementary feeding programs which are often of doubtful value. If growth monitoring is only for screening purposes it should be much less elaborate and not promoted as primary health care (Gopalan 1987).

**Growth monitoring can be used as a tool to direct food to children most in need.** A few projects have experimented with innovative methods for providing food supplements, when necessary, but with a preventive emphasis. The Tamil Nadu Integrated Nutrition Project (TNINP) in **India**, for example, focuses on early detection of growth faltering (little or no weight gain in three months). Monitoring is followed by various promotive activities, as well as food supplementation when appropriate. Rather than focusing on older children who are easier to find but among whom malnutrition is often far advanced, TNINP concentrates on children from birth to 36 months in order to prevent poor growth. Feeding is considered to be primarily the parents' responsibility. Participation in feeding is limited to 90 days for each "admission." The food serves as a supplement to help young children with

faltering growth back on "the road to health", and also provides an educational experience for the parents. The project has been able to economize significantly on food costs by limiting the frequency of participation and by sharper and more selective targeting (UNICEF 1986d:42-45). A midterm impact evaluation showed that during the first three and a half years of project operation the percentage of third and fourth degree malnutrition in the project block had declined 23 percent, while in the control block the percentage had increased 19 percent (FIW 1985:81).

**Food distribution should always be separated from growth monitoring activities.** Provision of food supplements, if it is necessary, should always be conducted apart from the weighing and educational aspects of growth monitoring. Hendrata and Rhode (1987:11-12) are adamant in their condemnation of monitoring projects that try to use food as an incentive:

...an over emphasis on food supplements have become one of the most common pitfalls in growth monitoring programs. In most cases the meal program soon becomes the central activity, perhaps the only one. Far from being an incentive to participate in nutrition education and health activities, food becomes the only reason for mothers to attend and then it is too small to be a real incentive to justify the effort they must make. The education value is soon forgotten and workers and mothers alike become preoccupied with the preparation and distribution of a meal. The educational opportunity is often sacrificed, and weighing is done in a perfunctory fashion.

Project planners in **Africa** note that when food is distributed those receiving the food aid feel stigmatized and some husbands will not allow their wives and children to be involved in the program. In **Indonesia**, problems are also common, but because the food is seen as a reward and mothers of healthy children who don't receive it feel cheated (Griffiths 1985:48). Therapeutic feeding may be needed, but it should be seen as a treatment to be provided elsewhere, so that food will not influence and divert the entire focus of the project (Hendratta and Rhode 1987:12).

### **Nutritional Surveillance and Assessment**

**Nutritional surveillance and assessment as a secondary benefit of the growth monitoring process.** As emphasized earlier, if growth monitoring is to make a difference to child survival, it must be focused on the individual child, with measurements frequent enough to detect growth faltering early. Growth monitoring is not necessarily required for nutritional surveillance, since surveillance can be based on periodic surveys, screening activities, or analysis of data already available. However, if growth monitoring has first been instituted to provide information for

individual action, its results can also be summarized to provide data for an on-going surveillance system or to assess the impact of health and nutrition interventions (Yee and Zerfas 1987:10). It may also be used to assess the impact of other types of social and economic programs. In Thailand, for example, data from the growth monitoring system were used to evaluate the impact of an agricultural development program (FIW 1985:8).

**Use of growth monitoring data for drought management.** A few countries have experimented with using growth monitoring data in periods of drought or famine. Botswana, for example, has used information from monitoring sessions to guide decisions concerning drought management and food procurement in periods of poor rainfall (UNICEF 1986d:23). There are limits, however, to the utility of growth monitoring information for certain situations. Experience has shown that it cannot provide an early warning of famine occurrence. In Uganda, for example, the government collaborated with UNICEF to experiment with using growth monitoring data for this purpose. Even poor agricultural data, it was discovered, was superior to accurate knowledge of present nutritional status in predicting future nutritional status. This is primarily because the weight-based indices short-term nutritional status are too labile to predict nutritional status far into the future. Less labile measures such as height-for-age, on the other hand, change too slowly to be timely indicators (Herbert 1987:16).

## **Conclusions and Recommendations**

**1. Selecting follow-up activities.** Project planners should seriously consider the design of what is often the weakest link in the growth monitoring process, provision of follow-up activities that will effectively address growth problems detected during the monitoring phase. Useful types of follow-up activities, for example, may include:

- Nutritional and health education
- Preventive and curative health services
- Referral to other health and child care facilities
- Supplementary feeding
- Nutritional surveillance and assessment

Selection will depend on the growth and health problems that must be addressed, the capability of the project itself to provide needed services, and a realistic assessment of the health system's ability to provide effective back-up support.

**2. The focus of educational activities.** Growth monitoring projects should definitely have an educational component, whether or not there are resources for other activities. Educational advice should be practical and individualized, providing mothers with guidance on specific actions they can take to maintain or improve their children's health and growth between one monitoring session and the next. Useful educational techniques for promoting good growth may include:

- o Using the growth chart itself as an educational tool
- o Involving the mothers themselves in educational message design
- o Developing flip charts, action posters and counseling cards that provide well-tested advice for specific conditions and age levels
- o Using growth-related games, plays, songs and slogan competitions
- o Fostering mother-to-mother exchanges, possibly by pairing mothers that have successfully weathered growth and nutritional crises with mothers of currently high risk children
- o Integrating mass media approaches with face-to-face education

**3. Supplementary feeding strategies.** If supplementary feeding is necessary, it should primarily be focused on high risk children under three who can be assisted in resuming healthy growth through short term food assistance (up to 90 days for each "admission") and parental education. Nutritional education without food supplements has been shown to make a significant impact on weight gain in projects such as the Nutritional Communication and Behavioral Change Project in Indonesia. When lack of food is a critical problem, activities to improve local food production or distribution may be helpful. In some cases food supplementation may be necessary. The Tamil Nadu Project in India has developed an effective "preventive" approach to food supplementation, using the strategy focused on short-term feeding of high risk younger children recommended above. The project was able to economize on food costs by limiting the frequency of participation and sharper and more selective targeting.

**4. Separating food distribution from monitoring.** Food distribution should always be separated from growth monitoring activities. Experience has shown that if food distribution is combined with monitoring it always tends to take over "center stage", diverting attention from important preventive and promotive aspects of the intervention.

## **VI. Expanding and Sustaining Effective Growth Monitoring Projects**

### **Issues for Project Design and Implementation**

What are the major behavioral and organizational problems most often confronted in efforts to expand and sustain growth monitoring projects?

How can effective projects be sustained when donors pull out or when small scale operations become large?

How can growth monitoring projects best be consolidated and integrated with other child survival and primary health care activities within the health system?

### **Difficulties in Expanding and Sustaining Growth Monitoring Activities**

A major discussion point at the 1986 UNICEF conference in New Delhi was that "Growth monitoring isn't working because it hasn't been tried properly." Large scale programs with well functioning growth monitoring and promotion activities are rare, due to a wide variety of problems (Yee and Zerfas 1987:9). Some of the major difficulties projects have encountered are examined below.

**Low awareness of the importance of good growth.** A recent analysis of difficulties within the growth monitoring component of the GOBI-FFF strategy suggests that a major problem hindering rapid expansion has been a general lack of awareness of the importance of good growth:

Child growth, its promotion and monitoring is a low priority and the overall climate in the developing countries is not sufficiently supportive in this area. Growth failure in early life and its significance in terms of survival, health and human capital formation is not sufficiently understood and appreciated. The level of awareness and attention among the public, families with young children, technical/ bureaucratic system and policy makers is very low. This is a major constraint in obtaining priority support for promotion of child growth and development" (Ghassemi 1986:1-2).

**Organizational difficulties encountered during expansion.** In addition to problems with lack of public and political support, major organizational difficulties have been encountered as growth monitoring projects try to expand. As Pyle (1986) observes, "The battlefield of development is littered with the corpses of small-scale projects that failed when attempted on a large or national scale. "Going to scale" -- replicating small-scale projects at a nation-wide level -- needs careful thought and specific planning that takes into account organizational, management, and political questions."

An analysis of the problems encountered in a number of typical small monitoring and nutrition projects in India that attempted to "scale up" suggests that while successful small projects are oriented toward results and managed with clearly defined objectives, large programs often become obsessed with coverage figures rather than the effect monitoring has on growth and nutrition. As a result, field workers and community members begin to view weighing as an end in itself and follow-up of children with faltering growth is rarely carried out. Large programs often spend an inordinate amount of time considering the mechanics of weighing, charting and technology design at the expense of analysis and effective follow-up of results (Pyle 1986).

**Poor health system support due to a weak health infrastructure.** Problems with weighing and scale technology and poor worker training need, of course, to be tackled. But the most serious difficulties, in many settings, are with the health system itself, and its lack of ability to provide proper treatment for children whose nutritional and health problems have been detected by the monitoring process. Growth monitoring is likely, at least initially, to increase the demand for services. If a strong primary health care structure has not yet been developed and the health system itself functions poorly or is unresponsive, growth monitoring may be a frustrating and ineffective activity, raising expectations without being able to meet the needs uncovered. A report from India graphically describes this problem:

In situations where less than 10 percent of pregnant women are being reached, where health and child welfare clinics fail to attract the bulk of under-fives and where domiciliary visits are cursory, few and far between, heavy investments on elaborate growth monitoring are likely to prove infructuous. It will be naive to assume that a liberal supply of weighing scales and growth charts will automatically correct these imbalances. To say this is not to argue against growth monitoring as such but to emphasize that conditions that would permit meaningful growth monitoring must first be created. To concentrate our energies on supplies of weighing scales and growth charts and on training of workers in the techniques of growth measurements without preceding, or at least parallel, intensive efforts to strengthen the health system, is to put the cart before the horse (Gopalan 1987).

**Lack of coordination and integration.** In many countries poor coordination between often competing health and development agencies, with costly and confusing duplication of services, also hinders efforts to develop and expand effective child survival interventions. In the **Philippines**, for example, it is not unusual to find, even within the Health Ministry, two or more bureaus undertaking the same or very similar activities, but each with its own delivery system, field workers, and supervisory structure (FIW 1985:106-7). In **Sudan**, as in many other countries, attempts to address health problems in the past led to the development of vertical programs in nutrition, maternal health, EPI, family planning and health education which rarely communicate with each other. As a result, for example, eight different cards for growth monitoring and vaccination were designed by different authorities and, until recently, were in use in the city of **Khartoum** alone (FIW 1985:111).

### **Examples of Large Scale Programs and What Has Been Learned**

As efforts to advance the Child Survival Revolution have continued, a number of the most populous nations of the developing world have attempted to institute programs which include wide-scale monitoring of their children's growth. **Indonesia** and **Thailand**, for example, are now monitoring the growth of approximately half their young children on a regular basis and **China** and **Brazil** are preparing to phase in country-wide programs over the next several years (NCIH 1987:3). A brief review of some of the issues involved in expansion and strategies certain countries have used may be helpful to projects just beginning the process.

**Creating mass awareness.** A number of countries have addressed the issue of low awareness and support by developing a variety of strategies to increase public and bureaucratic support and mobilize the resources necessary for a large scale intervention. The PREMI program in **Ecuador**, as mentioned earlier, held an extremely well publicized campaign which succeeded in weighing 60 percent of all children under age two. The campaign's high visibility and extensive coverage in the newspapers and other media helped ensure that growth monitoring activities were instituted throughout the country (Mothers and Children 1986:5). In **Thailand**, the effort to expand growth monitoring to a national level was part of a national campaign to improve the quality of life for all Thai people in which nutrition was featured as the most important Basic Minimal Need (Suntikitrungruang n.d.:7). (See the section on "Strategies for Promoting Effective Individual and Community Participation" for more details related to the mobilization process.)



**Expanding versus consolidating.** Indonesia, which quickly expanded growth monitoring from a pilot project effort to a national program with strong political commitment, raises some interesting policy issues. While the program achieved coverage in thousands of villages in a relatively short period of four years, coverage of children within the villages and the level of follow-up services remains low. Program supporters argue that the policy to expand before consolidating and upgrading program activities was a wise one: "...the very fact of the existence of the program in so many villages was considered an important factor in strengthening resource allocations for the program, as well as establishing the government's commitment to growth monitoring and related primary health care services as a national effort." The consensus was that improving coverage and service quality could be carried out subsequently, but that it was important to capitalize on the momentum for expansion while it lasted (FIW 1985:26).

Problems the Indonesian program has experienced with continuity (with 30 percent of weighing groups' activities discontinued after a period of a year) indicates a failure on the part of some communities to grasp the concrete benefits of the program. Difficulties such as these bring into question the wisdom of rapid expansion when proper back-up support is not in place. Recent efforts, described earlier, to use the monitoring sessions as an opportunity for "one-stop" primary health care service, however, are now making the program more attractive (FIW 1985:59).

**Developing effective management systems.** One of the largest and more successful efforts involving growth monitoring in India has been the Tamil Nadu Integrated Nutrition Project described earlier. It covers nine districts and over 17 million people. Its success in encouraging participation and improving nutritional status can be partially attributed to the fact that as it expanded, the project continued to focus on impact. In each area project managers, on a monthly basis, calculate the percentage of children under three that have been weighed (the participation rate) and the percentage of these children gaining weight (nutritional status rate). These two simple figures give administrators the information they need to determine where the project is and is not operating correctly. Extra support is then provided in villages that have lower performance figures and need attention (Pyle 1986). In addition, a well-designed monitoring and supervision system is in place to check the performance of local workers and provide support where needed.

**The danger of overloading the system.** Some projects, after considering the issue seriously, have decided that wide scale growth monitoring is not a proper use of their limited resources. The RUHSA project in India, for example, doesn't weigh children regularly. Project managers found that literate workers were necessary to do it well and yet the budget only allows for non-literate or semi-literate volunteers. Expenses for purchasing and maintaining the additional scales that

would be needed would be high, and project planners fear that an over emphasis on weighing would force the part-time village health worker to spend less time on other important primary health care services. This project has decided that well-designed nutrition education without time-consuming weighing is likely to be the most effective approach, considering resources and a community reluctance to have children weighed (FIW 1985:67).

As expansion and integration of services are considered, it is certainly important to resist doing too much too soon, if a system overload will result. This is especially important at the village level, where what has been termed the "skinny Hercules" phenomenon has often meant that a poor, uneducated and unpaid village worker is expected to manage numerous different programs at once (UNICEF 1987c:38). Regular weighing is surely unproductive if neither the front-line workers nor the health system that, in theory, is to provide them support, has the capacity to adequately follow-up on the growth problems detected.

### **Important Strategies When Expanding to Scale**

Just a few of the important strategies to consider when attempting to expand, stemming from the experience of projects such as those described above as well as others, is summarized below:

- o **Analyzing the success of small scale projects.** In order to make a successful leap from small-scale projects to programs that are effective on a national basis, careful planning is necessary. Large-scale use of proven strategies will result only if planners analyze carefully the factors that allowed smaller programs to produce real improvements in health and survival, rather than blindly seeking maximum coverage (Pyle 1986).
- o **Mobilizing with the assistance of organizations from all sectors of society.** It is not often that development projects reach a scale covering entire nations. Certain child survival initiatives have been able to achieve this goal through a massive effort of social mobilization, both generating political will at the national level and support among potential partners. It is essential to reach beyond the health ministry to all sectors of society for support--the public bureaucracy and private sector, non governmental organizations, religious groups, marketing specialists, the media, the community and families themselves (UNICEF 1987b:8).

- o **Learning from the strategies of other expanded programs.** Accelerated immunization programs in many countries have been the first to attempt to mobilize inter-sectoral support and draw on the assistance of private voluntary and religious groups at many levels. In the process the various organizations have gained valuable experience in working together and discovered new methods of dealing with problems of financial management, supervision and coordination on an expanded scale. Lessons can be transposed to other development activities, such as growth monitoring, that require complex organizational strategies to attain and sustain national coverage (UNICEF 1987b:8).
  
- o **Simplifying technology whenever possible.** Simplification is one excellent way to decrease work load, save time, increase reliability and reduce risk of error in measurement recording and interpretation. Growth monitoring is a field in which there is substantial potential for simplification. UNICEF and other organizations are working on a number of fronts to achieve new breakthroughs. Scale technology, as mentioned earlier, is an important area, with much of the effort focused on the perfection of the solar energy powered walk-on scale with digital reading system. Recording and interpretation procedures can also be streamlined. Counseling procedures can gain in clarity and specificity as knowledge increases concerning which health and nutrition interventions are most effective (Ghassemi 1986:3). Simplified technology and procedures will increase the possibilities for wider coverage, even without added budget or logistical capability.
  
- o **Integrating growth monitoring with other PHC or MCH activities and strengthening referral services.** Growth monitoring, as mentioned earlier, gains in effectiveness and long-term viability when it can serve as an entry point for participation in health care and assists in increasing utilization of other PHC and MCH services. Thus growth monitoring projects that are vertical in nature and non-interactive are unacceptable. Ideally monitoring should be part of a comprehensive health care system, but it can be initiated before other health services are fully in place, if adequate follow-up is assured, possibly through on-site education and simple services. It is wise, however, to focus simultaneously on strengthening weak health systems and to integrate growth monitoring activities rather than to develop them in isolation (FIW 1985:26, Gopalan 1987).

## **Conclusions and Recommendations**

**1. Strategies for expanding to scale.** When undertaking the difficult task of expanding while attempting to maintain project effectiveness and impact, project planners should consider strategies found by other practitioners to enhance possibilities of success. Experience has shown, for example, the importance of:

- o mobilizing needed support by involving organizations from all sectors of society, rather than concentrating purely on health-related groups and institutions,
- o analyzing the success of small scale projects in order to learn what programmatic features are essential to maintain while expanding,
- o learning from the experiences of other large programs (e.g., EPI or family planning) and studying (and possibly using) systems they have developed to successfully deal with problems of financial management, supervision and coordination on an expanded scale,
- o simplifying technology by improving scale and recording technology, tailoring educational messages more accurately, and streamlining work flow, for example, so that wider coverage can be achieved, even without added budget or logistical capability, and
- o integrating growth monitoring with other PHC or MCH activities and strengthening referral services.

## **VII. Qualitative Methods for Studying Behavior Related to Growth Monitoring**

### **Issues for Project Design and Implementation**

What qualitative research methods have been helpful in obtaining information of use both in designing and assessing interventions in the area of growth monitoring and promotion?

### **An Overview**

Qualitative research methodologies can be quite effective in exploring problems and proposing and testing solutions to the difficulties that still plague the field of growth monitoring. An examination of the entries in the bibliography for growth monitoring, when compared to those in other child survival areas such as breastfeeding or ORT, indicates that research has played a much smaller role in this field thus far. Much of the valuable information on alternative design and implementation strategies and their results has come from field reports and evaluations, with many fewer formal research investigations. And yet an intervention such as growth monitoring lends itself very well to examination using a variety of research approaches.

The goals of this current analysis did not include methodology, but it is useful to provide at least a brief review of some of the qualitative methodologies that have either been employed or proposed for use in the field. Many of the techniques that are valuable for studying the action or promotional component of growth monitoring have been discussed in Monograph Four, Breastfeeding, Weaning and Nutrition: The Behavioral Issues, and will not be discussed in detail here.

### **Community Diagnosis and Baseline Studies**

In the project planning stage it is often quite helpful both to undertake a "community diagnosis" which explores the nature of local growth and nutrition problems and to conduct more formal baseline studies which may later be used as a comparison when assessing project achievements. Preliminary investigations of these types are often most successfully conducted with active participation of community members, certainly as informants and often as data gatherers, analysts, and advisors.

The Applied Nutrition Education Project (ANEP) in the Dominican Republic, a large-scale effort that has focused on growth monitoring, nutrition education and community projects in 90 economically disadvantaged communities, undertook extensive research before designing specific project activities. In addition to statistical information, qualitative research was needed. A preliminary survey enabled the project planners to identify major nutritional problems in the community. Case studies were then prepared of 158 families with malnourished children, using a standard form to collect socioeconomic data and information about family health and nutrition practices. Once this information was analyzed, project priorities were identified. But even with the data available, project designers needed more information about what mothers thought about current infant feeding practices, how they could be improved, and the feasibility and acceptability of solutions being proposed. Thus focus group interviews were held with selected mothers, covering topics such as child growth, feeding children 0-8 months of age, and prevention and treatment of diarrhea. Based on these informal, open-ended, and very informative discussions the needs and wants of participants were identified and the first phase of educational activities designed (Mothers and Children 1985).

### **Situation Analysis**

Another approach to collecting useful information about communities and the problems inherent in implementation of particular Child Survival interventions is the use of "situation analysis", a study strategy adopted by UNICEF with considerable success. The specific research techniques used in situation analysis vary, depending on the setting and the topic.

One example of the use of this technique in the area of growth monitoring is a "Situation Analysis of Growth Charts in the Philippines" (UNICEF/Manila 1983). This study first explored the growth chart "problem" at the central level, conducting interviews with a total of seven Manila-based agencies that either developed growth charts or used them. Questions focused on intended use versus actual use, users, feedback systems, printing and distribution, problems encountered, and recommendations. After determining the different growth charts available and each agency's distribution network, interviews were conducted with health personnel in four regions of the country, as well as the capital. Questions focused both on record-keeping in general and growth charts and their distribution, how they are used, monitoring, and problems encountered. A small sample of mothers were also questioned concerning their awareness and understanding of the charts, how they use them, where they are kept, any orientation received, problems, and suggestions for improvement. A descriptive analysis was then performed. The report provides

specific information useful when attempting to alleviate growth chart problems both at the national and local level.

### **Case Studies of Small and Large Scale Projects**

As mentioned in the discussion concerning project expansion, analyses of small projects that have successfully accomplished their objectives can provide extremely useful insights concerning the processes that have enabled particular organizations to have a major impact on child growth and survival. Similarly, studies of successful large scale programs can also be helpful. An excellent example of this case study type of investigation is a very informative investigation of seven small scale nutrition projects in one state of India. The research identified certain common factors that helped these projects succeed as well as the difficulties encountered as the projects were expanded to large-scale government operations -- problems that substantially lessened their impact (Pyle 1981a, Pyle 1981b).

### **Studies of "Adequate Growth Amidst Poverty"**

The UNICEF initiative to encourage and sponsor studies of families and children that do well in situations where poor growth in the norm is likely to be a quite useful one (UNICEF 1986d:10 and 35). Investigations of why some children grow very adequately in very low income households have been few, but results can be quite helpful in indicating what project strategies may best promote growth when resources are scarce. The study of infant and weaning practices in Mali described earlier (Dettwyler 1986) is an excellent example of research of this type.

### **Systems Analysis and Use of Observation Guides or a Thesaurus**

Systems analysis, if practical in orientation, can be quite useful in clarifying how growth monitoring projects actually work and the major problems that hinder their operation. The second Primary Health Care Operations Research Project (PRICOR II) is working with national Ministries of Health and researchers in a number of countries to document and analyze the activities of PHC workers through the application of a systems analysis methodology which: 1) describes how key aspects of the PHC program actually operate, and 2) identifies specific operational problems that hinder effective delivery of PHC services at the peripheral level (PRICOR 1988a).

PRICOR has found systems analysis to be useful because it provides detailed information on how service delivery activities are routinely conducted -- information often lacking in surveys and evaluations that tend to focus either on program inputs or results. As the first PRICOR Report (1988a:2) observes:

A systems analysis differs from most evaluations in that it pinpoints weaknesses and deficiencies in a program's operations which can be addressed through immediate action or through practical, problem-solving research. By shifting the focus from outcome and impact indicators to process measures, a systems analysis provides program managers with valuable information to strengthen ongoing programs.

In order to describe how health workers undertake a large number of activities and tasks, PRICOR has developed a tool to assist investigators in identifying and measuring the key activities involved in PHC. This tool, the PHC Thesaurus mentioned earlier, is a compilation of major activities, tasks and sub-tasks that are necessary for effective service delivery, with indicators for measuring their performance. The PHC Thesaurus covers growth monitoring, as well as other important Child Survival and MCH interventions. A page from the growth monitoring section is featured in the first PRICOR Report, along with examples of the types of information it can generate in typical field settings. (See figure 13.) Copies of the PHC Thesaurus are available from PRICOR (1988b).

### Operations Research

Operational problems abound in all five of the major components of growth monitoring projects (motivating, weighing, recording, interpreting and taking action) and yet operations research has only been used in a limited way in this field. Operations research (OR) can be of assistance in addressing problems related to all these components, and both donor agencies and projects themselves are beginning to consider new ways of drawing on this important tool (Teller 1986). UNICEF, for example, has recently proposed that side-by-side study/action components be built into on-going projects: "This is a fine tuning mechanism which would identify and test technically acceptable, administratively feasible and financially affordable elements for programme strengthening and incorporate them into the programme and would monitor programme performance on a large scale" (Ghassemi 1986:5).

An excellent discussion of the "Application of Operations Research to Growth Monitoring/Promotion" (Teller 1986) explores the operational issues that could fruitfully be addressed by OR as well as current approaches and OR methods in growth promotion. During initial assessments of the health and nutritional



**Figure 13: Page from the Growth Monitoring Section  
of the PRICOR PHC Thesaurus**

<b>2. PROVIDE GROWTH MONITORING</b>		
<b>2.1 Prepare Equipment And Supplies</b>		
2.1.1	Tare scale to 0 <i>% of observed weighing sessions for which scale is tared to 0</i>	Weighing Session Observation
<b>2.2 Monitor Children's Growth</b>		
2.2.1	Calculate child's age <i>% of observed children for whom age is correctly calculated by health worker</i>	Weighing Encounter Observation
2.2.1.1	Record child's birthdate	
2.2.1.2	Count the number of months since child's birthmonth and record in appropriate place on card	
2.2.2	Weigh child	
2.2.2.1	Set scale to 0	
2.2.2.2	Remove child's clothing	
2.2.2.3	Place child correctly on scale	
2.2.2.4	Read scale indicating child's weight <i>% of observed weighings in which health worker reads the child's correct weight</i>	Weighing Encounter Observation
2.2.3	Plot child's weight per type of card <i>% of observed children weighed for whom plotted weight equals read weight</i>	Weighing Encounter Observation
2.2.4	Counsel mother (See Growth Monitoring/Promotion: Service Delivery—3.1 Provide Individual Counselling To Mothers Of Children Attending Growth Monitoring Sessions)	
<b>2.3 Refer Children</b>		
2.3.1	Refer sick/malnourished child for medical attention/nutritional rehabilitation <i>% of observed sick/malnourished children referred for medical attention/nutritional rehabilitation</i>	Weighing Encounter Observation

(PRICOR 1988a:3)

situation, the report suggests, research strategies using sample surveys, questionnaires, service statistic epidemiology, in-depth interviews, focus groups, case studies and structured and participant observation may be of greatest value. Methods for use in OR during program design, implementation and evaluation may include systems analysis, logical frameworks, nominal group techniques, multiple-criteria utility assessment and cost-effectiveness. It is essential to focus on generating only the minimal data needed for technically sound and appropriate decisions at the individual, family, social group, community, and district levels. One of the most important contributions of OR in developing countries, the report concludes, is that "field implementors do not necessarily have to wait for the slow bureaucratic process of policy change. They are able to make effective and timely use of the results, particularly if they participated in the research process" (Teller 1986).

Monograph Four in this series, Breastfeeding, Weaning and Nutrition: The Behavioral Issues, discusses additional qualitative research techniques such as community nutrition assessments, ethnographic methods for exploring infant feeding practices, observational studies, focus groups, participatory approaches at the household level, behavioral analysis and health practice studies. These techniques can be of use in growth monitoring research as well.

## Conclusions and Recommendations

**1. Using qualitative research. Use of well-designed qualitative research as a problem-solving tool should be considered seriously by project implementors as part of an overall strategy for strengthening project impact.** Research has played a much smaller role in project development in growth monitoring than in other child survival areas such as ORT and breastfeeding, but its potential contribution is great. Qualitative methods that have been employed successfully in the field include:

- o Community diagnosis and baseline studies
- o Situation analysis
- o Case studies of small and large scale projects
- o Studies of "adequate growth amidst poverty"
- o Systems analysis and use of observation guides or a thesaurus
- o Operations research

Additional techniques that may be particularly useful in the growth and nutrition area are discussed in Monograph Four, Breastfeeding, Weaning and Nutrition: The Behavioral Issues.

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[Country name] = Document provides information related to the country, but its name is not listed in the citation.

[USAID] = Document is in the AID/CDIE collection

[IFMN] = Document is in the collection at APHA Clearinghouse on Infant Feeding and Maternal Nutrition, Washington D.C.

[UNICEF] = Document is in the library at UNICEF/New York

[Wellstart] = Document is in collection at Wellstart, San Diego

\* = Study sponsored by A.I.D.

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