

©ITGPress, Nationalestraat 155, B-2000 Antwerp, Belgium. E-Mail: pkolsteren@itg.be

Patrick Kolsteren, Tom Hoerée and Armando Perez-Cueto E., ed. Promoting growth and development of under fives Proceedings of the International Colloquium, Antwerp, 28,29,30 November, 2001 D/2002/0450/1 ISBN 90-76070-22-9

In collaboration with



pour le développement



The publication of this book was made possible through the support of the EC Directorate General DEV

Promoting Growth and Development of Under Fives

Edited by

Patrick Kolsteren, Tom Hoerée and Armando Perez-Cueto E.

Proceedings of the International Colloquium, Antwerp, 28,29,30 November, 2001

FOREWORD

Malnutrition is still a very important problem today, which is in dire contrast with the general interest it receives as a priority theme for intervention as well as for research funding. Although in the past many efforts were made to alleviate this burden, not all have been as successful, which is an argument to reflect on a number of strategies. Then why organize a colloquium on growth and development?

A number of observations can justify this choice. First, growth monitoring which has for long been a cornerstone strategy to improve nutritional status of children is hotly debated. Discussions are held regarding its concept, technical and operational difficulties, whether it is a good solution to the problem and around possible alternatives.

Secondly one can query whether having focussed the objective on nutritional status and not on a more comprehensive concept such as growth and development, has been the reason for the relative failure of growth monitoring. A child is more than a weight increment and growth failure is the expression of a multicausal problem, with roots in direct, family and community causes. These are not separate, but strongly interlinked. So far interventions have predominantly focussed on food intake. On the other hand preventive activities are often directed towards one particular risk and performed by different health workers. Activities are separated in space and time. Improving and safeguarding an optimal nutritional status cannot be separated from other problems children face. Comprehensiveness is definitely called for.

Thirdly, many experiences exist but they remain in the peer review sphere. Researchers have researchers as peers and implementers have implementers as peer. Cross-fertilization is rare. In addition, solutions will have to be looked for in a multidisciplinary approach. Both the analyses of the problem and of possible solutions should take place in a multidisciplinary forum.

The present colloquium was therefore organized to bring together different disciplines (anthropologists, health workers, psychologists, etc) and a mix of researchers, fund raisers, NGO's and field workers. The aim is to come up with alternative strategies to promote growth and development that have benefited from a wide multidisciplinary input. Hopefully this meeting will be a turning point to revisit actual strategies, create new networks to test and implement a more comprehensive approach towards improving growth, nutrition and development of children with recognition of the limits poverty impose. The colloquium comes also at a time when a large project: "Health sector reform: Towards a more global approach for improving child growth and development", Funded by the European Union under the INCO programme, and by Nutrition Tiers Monde is finalized. The colloquium could only take place thanks to the generous contribution of the European Union, the Flemish Ministry of Health, the Directorate General for Development Co-operation of Belgium, the Institut de Recherche pour le Développement, the City of Antwerp and the Fortis Bank. A gathering like this is only possible thanks to the contribution of many who organized logistics, travel, invitations, venue, technical support, the reviews and all the not very visible but necessary activities. To them our sincere thanks.

GROWTH MONITORING AND PROMOTING GROWTH AND DEVELOPMENT

SYNTHESIS OF THE COLLOQUIUM

Patrick Kolsteren¹, Tom Hoerée¹, Dominique Roberfroid¹

Introduction

In the present colloquium presentations and related discussions have constantly returned to growth monitoring when talking about strategies to improve growth and development of children. Growth monitoring has indeed, for years been one of the cornerstone interventions to improve nutritional status of young children and it is still largely promoted as one of the basic health delivery activities and in vertical programs. It appears that not all that many alternatives exist or that the use of growth monitoring is still hotly debated.

The presentations of Beghin and Latham give a good overview of the changing paradigms in promotion of growth and development over the years, where they stress the need to go beyond the objectives of growth monitoring as they are stated by WHO. Why then has it proven virtually impossible to adapt growth monitoring toward a broader concept of promoting growth and development? In many of the discussions, it was argued by some that they believe in growth monitoring and that it works even in no hard proof exists. Arguments have become more emotional and loaded with personal conviction. Although perhaps striking at first, there might be some proof in these emotional arguments. Many will agree that very much depends on the person or the organization that is running the programme and the presentation of Coulibaly also underlines this point. We could set aside these arguments by saying that there is no hard evidence to support the hypothesis that growth monitoring decreases malnutrition or has an effect on child survival. But this would be disregarding, to some extent, the limited number of controlled trials their limits. With their nature of control they overlook the intricate relationship between actors when dealing with community or people oriented interventions, which are of particular

¹ Nutrition and Child Health Unit, Institute of Tropical Medicine, Antwerp, Belgium

importance in a type of activity where much relies on the credibility of the provider. "No proven effect", cannot be interpreted as a failure of the conceptual basis of the intervention per se. It could also be a problem of implementation, acceptance, relation health worker parent, etc. Particular in relation to this last point, we find indeed that the majority of the arguments against growth monitoring are of a technical nature. The present synthesis therefore tries to look at growth promoting activities in a more comprehensive way with as particular objective the search for alternative solutions.

As a health related activity, growth monitoring knows three dimensions; need, demand and offer. Need is defined by experts analyzing a health problem and based on epidemiological criteria. The second dimension is the demand of the population for a particular health care service. The third dimension covers healthrelated activities, curative or preventive, offered to the population.



The three dimensions overlap and create seven possible situations. The ideal one is obviously that what is offered translates both a need and a demand. In the following section we will try to analyze growth monitoring using these facets with the underlying hypothesis that the relatively disappointing results observed are due to a weak overlap between offer, need and demand.

Growth and development promoting activities organized until now

The need for growth promoting activities

In the past the needs assessment has largely focussed on malnutrition, where wasting was the particular concern. The main focus has been growth monitoring. This is defined by the WHO as a nutrition intervention that not only measures and charts weight of children, but uses the information on physical growth to counsel parents and motivate actions that improve growth (1). It is thus an approach to detect growth faltering in a child long before the very typical clinical picture of malnutrition becomes evident. The pattern of the curve should elucidate the physical state of a child for both health worker and parent so that corrective measures can be initiated preventing a child from becoming malnourished (2-4).

The reason for addressing malnutrition is the documented associations of increased risk of dying, a relationship related to the degree of malnutrition. The growth curve used together with regular weighing and plotting is thus in essence a screening tool to identify children not gaining weight properly or even loosing weight.

Malnutrition is without doubt an important problem, which seriously impairs growth and development of children (5,6). But how strong is the relationship with mortality, the final objective? Mortality is a multi-causal phenomenon in which malnutrition is but one factor. This explains the large variation in association documented in many studies on the relationship between malnutrition and mortality.

What was offered for growth promotion?

Here again the health system has limited offer of services for promoting growth and development to growth monitoring. When implemented, health workers privilege the technical aspects as the paper of Roberfroid demonstrates. The communication part is felt as the least important.

What is offered is for a large part a screening instrument. This, however, should respond to a number of characteristics (7).

The condition screened for should be important, which is certainly the case for malnutrition and its related mortality.

The early stages of the condition should be well understood. There is unfortunately, very little information on the significance of early stages of malnutrition in relation to developing more severe forms later. Although weight is a very sensitive indicator it is, unfortunately, not very specific. Weight fluctuates considerably over short time intervals. The condition is thus not easily interpreted. Even in the best of situations growth still tends to regress towards the mean. Small babies will catch up and large babies will catch down. Experience shows that one baby in 20 will cross 2 centile channels equivalent to 1.3 standard deviations (8). Add to this that stunting sets in very early in life with weight following height trend, most children will be seen to have a growth curve that deviates progressively from the average weight curve.

Treatment at an early stage should be better than later. It is clear that severe malnutrition still entails a high case fatality rate (9). Although treating malnutrition early is definitely less hazardous, this does not mean that it is necessarily easier. The cornerstone of treatment of early forms of malnutrition is by informing the mother what she should feed the child. But as we know changing behaviour is a complex issue and information is only a small part of the pathway. Messages should be socially accepted in the family and community, the right decision maker should be targeted and mothers are often limited in changes they can introduce given their social position.

Although weighing is sensitive for changes, it does not identify correctly the children who are at risk. The weighing itself is often flawed with inaccuracies and technical mistakes.

Acceptability of weighing is also not always high. It is an important investment in time and resources for the parents and in certain situations considered harmful. Sometimes the cause of malnutrition is attributed to the weighing bag or a spiritual contamination via the weighing of a malnourished child to a healthy child. Mothers are also very concerned about the health of their children. A bad growth and development of a child is easily interpreted as a direct failure to be a good mother and therefore carries with it an important negative connotation. This negative aspect is often transferred from health worker to mother who scolds her for not looking after her child very well. Acceptability is in addition also very much determined by the degree by which an intervention responds to a demand. Parents do evaluate growth and development of their children but use other criteria than weight increments or the position on a curve as the presentations of Lefèvre, De Suremain and Bonnet suggest.

The correct interval between weighing sessions is not very clearly defined. Short intervals increase sensitivity but are more prone to influences of normal weight variations and measurement errors. Decisions are delayed for months because it is difficult to interpret short term variations. Long intervals lose in sensitivity and the lack of more detailed information makes decisions difficult.

Weighing is also a considerable investment in personnel. For a target population of 10000 people and weighing children six times in the first year of life and four times in the following years, a total of 8800 weighing sessions are needed. With an average of ten minutes per session, this represents a workload of 1466 effective hours or almost the equivalent of one full time. Finally screening should be applied to all persons at risk and on a regular basis. With health service coverage, we know that health service utilization decreases when the distance is more than five kilometres. Many families live outside this perimeter. The evaluations of compliance to growth monitoring programmes also show that the weighing schedule is adhered to as long as the vaccination schedule is offered. Once vaccination is complete, very few return for weighing.

The accumulated evidence presented so far underlines the very weak basis for using growth monitoring as a screening tool. Weighing used as a preventive activity has sometimes also perverse effects. Weighing will not be performed anymore as part of curative activities and many malnourished cases will go undiagnosed. Indeed many children presenting with an illness will have a varying degree of malnutrition and therapeutically it is important to address both the disease and weight loss. An analysis of children participating in a nutrition rehabilitation program in Bolivia showed that the participants were six time more likely to have been identified in the curative consultation than through regular weighing.

The demand for growth promotion

The connection between body proportion and food is not directly made in many communities. Thinness is not a "disease" as such and therefore does not fit the concept of seeking cure in the medical model people have. People use different models and levels of causality to explain changes in health. Spirits, a weighing bag, the shadow of a woman who recently had an abortion and the like, all can transmit malnutrition (10, 11).

When caretakers are asked about their expectations and perceptions on child growth and development, we find a consistent pattern across different societies. Parents evaluate their children in a global way. They should be sociable, have a general good appearance, not be a nuisance, and start walking and eating well. As Tonglet mentions, parents correctly appraised growth performance of their children when asked and this was more effective to identify correctly malnourished children than regular weighing.

Parents also expressed that they had a desire to be able to communicate about the development of their child with health workers but that they were seldom given this opportunity. The accent of the contact is the weighing and the plotting and not the overall performance of their child. They feel that the health worker is not interested in what they want. The growth pattern in terms of weight curve profile, is something that does not enter in their toolbox of evaluations. It remains for them very much the domain of the health worker and his expertise.

It is therefore not surprising that both health workers and caretakers express a degree of frustration around growth monitoring. The parents feel they are not listened to, and treated badly because they do not understand very well what the discourse of the health worker is all about. The health worker from his side, feels disenchanted because parents seem to have little interest in the weighing, the curve, the information provided and in their willingness to change behaviour.

To abandon or redefine?

Need to broaden the scope

Health services have thus predominantly offered regular weighing to identify children who are gaining less weight than they should. The underlying assumption is that when growth is suboptimal health education should be given to the parents. From the preceding parts it is obvious that GM performs badly as a screening tool, that what is offered does not really respond to the demand of caretakers, and that the need is broader than only weight increments as De Onis clearly suggests. What is offered in terms of advice also follows a linear paradigm between information and change of behaviour. The cause of malnutrition is distilled to a lack of information given to the mother. This unfortunately overlooks the broad environmental context of the causality of malnutrition. First malnutrition is rooted in poverty. There are often limits to what people can change in their diet. Information only frustrates parents who are very well aware of their daily struggle to provide enough food for their children as clearly demonstrated by Duffield. There are thus enough arguments to support a thesis to abandon growth monitoring altogether. But then we have been looking at one answer to a much broader problem or to put it differently; at the wrong answer to the wrongly identified problem.

Even if nutrition education has been performed in a linear fashion, it would be too simplistic to regard poverty and lack of information as the sole limiting factors in behaviour change. As the HEARTH model presented by Berggren shows, there are positive deviants in a community. These families are able to have healthy and well-nourished children although they have the same resources as families with malnourished children. The reason for this might lie in the fact that we have to a certain degree overlooked that malnutrition of a child is a family problem. In many societies married couples live in an extended family where strict hierarchical rules apply. A mother cannot change what she gives to the child unless her husband or other members of the family approve it. In such setting it is often inappropriate that she should even propose a change in food habits. In other settings the decisions on what is spent on food and what is bought is the right of the husband. Given the serving role of women in many societies it would be highly inappropriate for her to suggest her husband to take other decision. But there is perhaps an even more profound reason for the reticence towards behavioural change. Proposing that something must change means that there is a problem, in this case a malnourished child. This would directly imply that the mother has failed to care for her child properly, and in her duties as wife and mother. Imagine the public blame and admission of failure.

If malnutrition is up to a certain degree a family issue it could also be regarded as an expression of dysfunction of the family. In a study of a nutrition rehabilitation program in Cochabamba city, Bolivia, it was found that the majority of malnourished children came from socially deprived families or families with familial tension (12). Bouville presents similar findings from an African community. In Europe a majority of failure to thrive children comes from broken homes, single parent families or where social fitting-in is less than optimal. Family tension, wives left by their husbands, living is tension with in-laws, neglect, illness or depression can all contribute to disinterest or capacity of the mother to care. These elements are not the sole property of developed countries but exist in developing countries as well, although not so well documented. Malnutrition is somewhere along the line always due to a deficient food intake, but the mechanisms responsible for this relationship are much more than poverty or a lack of information alone.

There is a demand for support in growth and development from the parents side and one can argue whether having as objective promotion of growth and development would also not address need better. Indeed, as the paper of Pelto underlines, the objective should be to promote and safeguard as much as possible the health potential of children, and this with an integrated approach. We know that children face certain risk during the first years of life. Some of them can be screened for others prevented through vaccination, others still need a communication with the parents on how to cover nutritional needs of the children or how to prevent accidents.

This needs assessment with critical periods can be translated in a schedule of contacts that are needed between family and health worker. Screening for malnutrition should not be regarded a priority. For this GM is not very well suited. This is also the case for stunting. The pathologies related to stunting are so obvious that they will be diagnosed without using stunting as a prime clinical sign. As Hall present in his paper, a single height measurement once around the age of five is sufficient to identify the two conditions that might have been late in diagnosing: Turner's syndrome and isolated growth hormone deficiency. One aspect of screening, largely overlooked, is the ethical commitment to act upon the information at hand. In the case of stunting the causality is so complex and imbedded in socio-economic factors that health services will have very little impact on it with activities they can implement. The screening should definitely not be broadened to include height measurements.

Responding more to demand, broadening the scope and redefining the objective towards the promotion of growth and development also asks for other evaluation tools. As argued by Engle, we also need indicators to measure development. Following the analyses done in the UK and the poor specificity of development indicators to identify deviation from normal at the individual level, there seems to be no need to introduce individual indicators and active screening. There is a risk of falling in the same trap of screening for insufficient weight increase. Arguments to have indicators on a community level are however very strong. At present they do not exist however

What alternative to offer?

Although we should accept that growth and development is very much defined by socio economic conditions, this should not lead to a sense of defeatism. The reason for the failure of nutrition education must be sought in the failure to have addressed the complex interplay between food and family dynamics. Children with a sub optimal growth should be considered symptom carriers of a family tension. A solution would need to be found within this reference framework. A patient or child centred approach is what is called for because a multidimensional problem cannot be resolved with a standardized, unique procedure. But as mentioned in the papers of Bossyns and Criel, this would need to fit in a new attitude of health workers or community workers. Standardized protocols frustrate the creativity of health workers and simplify a complex family and community context. First parents know when something goes wrong with their children and they can be asked as Tonglet shows in his paper. An approach where health workers are free to discuss matters with parents improves matters considerably according to the presentation of François.

This poses however, some serious challenges. Medical education and attitude should refocus on putting the patient central within his environment as opposed to the search for a diagnosis and a drug treatment.

Even with a child centred approach, with all the challenges this will bring, supportive mechanisms must be in place, which also includes counselling for social or psychological problems. A clear distinction must be made from the beginning on the specificity of health service and community approaches. Both should be complementary and preferably organized at the same time.

Health services must follow up children according to a schedule of risks children face during their development period and invest in making an individual diagnosis. Here we must accept though, that much more needs to be invested in understanding the demand side of the parents. The weighing, screening and nutrition education has dominated very the way research questions have been formulated

Parents and community can and should be directly involved in a programme to promote growth and development of their children, as presented in the papers of E. Sejas, Rubin de Celis and Pecho. First a booklet that explains better growth and development issues with practical tips on growth and development, including feeding and schedules where a contact is needed with the health services increases self-determination of parents and their confidence to interact with health workers. They become clients who are more aware of their rights. The community approach underlines the important role parents can play to improve the development of their children by discussing how their children develop, what their expectations are and how their children learn, and interact socially. Community programs should be directed towards promotional aspect and increasing self-determination. They should take the form of health clubs or mothers clubs, where issues on growth and development can be discussed. It is important that this aspect includes not only mothers but also members of the community who can have an effect on child growth and development.

Whenever an activity is initiated to identify problems that might have occurred, there is also an ethical need to propose solutions and offer services. When a child is identified with a problem an individual diagnosis has to be made involving the family. The diagnostic possibilities are diverse given the multifaceted nature of growth problems. The need for curative interventions has to be excluded first or when deemed necessary, offered. Logical as it seems, this is where many things have gone wrong in the past. Making a diagnosis means having a clinical judgement capacity. An untrained health worker cannot do this. Unfortunately, untrained health workers or even community health workers are mostly in charge of growth monitoring. In addition, very few health services provide nutrition rehabilitation, have standardized guidelines or an active referral system despite the fact that with little input, a lot can be done at the first line (13). In hospital, children are treated for diseases, and it is left to the parents to feed the child. Very little of the recently published guidelines of WHO can be found implemented. It is sad to see in how many hospitals the basis of nutritional rehabilitation is still the high protein diet.

What then about the screening? Finding and helping malnourished children should remain a top priority of health services and health programs. The most efficient way, however, to find those children is to introduce weighing during curative services. The link between disease and nutritional status is so strong that these conditions often present together. Weighing and charting weight development provides important information but one has to accept that this is predominantly so for the health workers. A weight history provides additional information on the condition of a child and helps to make a correct diagnosis and define the course of action. The weight progress has little significance for the parents. Regular weighing can still help identify malnourished children but then when it is part of a larger conceptual program of promoting growth and development. The weighing is not the prime objective anymore.

Last but not least optimal growth and development should be considered a human right. Poverty alleviation and entitlement should receive priority investment. As much as possible and preferably always, the community, health system approach and poverty alleviation should be promoted together and not as a choice menu.

References

- 1. WHO. The growth chart. A tool for use in infant and child health care. *Geneva: World Health Organization*, 1986.
- 2. Garner P, Panpanich R, Logan S. Is routine growth monitoring effective? A systematic review of trials. *Arch Dis Child.* 2000;**82**:197-201.
- 3. Thaver IH, Husein K, Cara NB. The "P" in GMP--a major shift in growth monitoring program of a primary health care project. Southeast Asian J Trop Med Public Health. 1993;24:23-7.
- 4. Henry FJ, Briend A, Cooper ES. Targeting nutritional interventions: is there a role for growth monitoring? *Health Pol Plann.* 1989;**4**:295-300.

- 5. Schroeder DG, Brown KH. Nutritional status as a predictor of child survival: summarizing the association and quantifying its global impact. *Bull World Health Organ.* 1994;**72**:569-79.
- Pelletier DL. The relationship between child anthropometry and mortality in developing countries: implications for policy, programs and future research. J Nutr. 1994;124:2047S-81S.
- 7. Wilson JM and Jungner G. Principles and practice of screening for disease. Public Health Papers No 34. *Geneva: World Health Organization*, 1968
- 8. Hall DMB. Health for all children. Oxford: University Press, 2000.
- 9. Waterlow J. Treatment of children with malnutrition and diarrhoea. *Lancet.* 1999;**354**:1142.
- 10. Kolsteren PW, Lefèvre P, Lerude M-P. Nutrition rehabilitation and the importance of the perception of malnutrition in the follow-up of rehabilitated children. *Asia Pacific J Clin Nutr.* 1997;**6**:106-10.
- 11. Launer LJ,.Habicht JP. Concepts about infant health, growth, and weaning: a comparison between nutritional scientists and madurese mothers. *Soc Sci Med* 1989;**29**:13-22.
- 12. Sevilla R, Sejas E, Zalles L, Belmonte G, Chevalier P, Parent G *et al.* Le "CLAPSEN" une démarche globale pour la réhabilitation nutritionnelle de l'enfant gravement malnourri en Bolivie. *Cahiers Santé.* 2000;**10**:97-102.
- 13. Hoerée T, Kolsteren PW, Roberfroid D. La prise en charge de la malnutrition chez les enfants préscolaires: le rôle des services de santé. *Cahiers Santé*. 2002;**12**:94-9.

OVERVIEW OF HOW HEALTH SERVICES TACKLE PROMOTIONAL ACTIVITIES FOR GROWTH AND DEVELOPMENT

Ivan Beghin¹

Introduction

The question the organizers of the Colloquium asked me to deal with was: **"How do health services tackle the promotion of** growth and development?"

The answer, I am afraid, is "poorly". Or, at least, that was true in the mid-nineties, as we shall see. After 40 years or more of growth monitoring all over the world, health services still don't know for sure how to genuinely and effectively promote the healthy growth and development of young children, while in contrast they very well know how to immunize successfully, or to use oral therapy, or to promote family planning. The paradox is that growth monitoring is very old, even in developing countries!

In this brief overview I shall take a few highly selected historical moments, and draw on my personal experience, as I was explicitly invited to.

The early days

Growth monitoring seems to have a double origin. In the first place it clearly was an extension of the periodical weighing of children, which was practiced in the North since at least the beginning of last century. In the late 50's, for example, when I arrived as a rural doctor in the Congo, weight monitoring was routinely practiced, and where available UNICEF dried skimmed milk was given for a few weeks to the children who didn't thrive. Weights were noted down on an individual card, but no graph was used yet, and no promotion of growth was performed.

This brings us to the second origin: the need to screen malnourished children once a reasonable effective treatment had become available. In Haiti, for example, in the mid sixties, with Fougère and King we designed a growth chart based on Gomez classification of degrees of malnutrition, to select children for referral to nutritional rehabilitation centres (1). In Colombia, Rueda

¹ Professor Emeritus, Institute of Tropical Medicine, Antwerp, Belgium

Williamson adapted a chart developed earlier by Tony, which combined weight **and height**. As the Director of National Institute of Nutrition, he actively promoted his "auxogramme" which, interestingly enough, was also used for counselling the child's mother. Rueda's chart did not spread out: it was too complicated, and experience showed that repeated measurements of height by low level health workers was time consuming and unreliable. Yet this chart was a pioneering tool in two aspects: its use for educating the mother, and its consideration of height.

Anyhow, during all those years, in most health services in developing countries, growth monitoring was synonymous of " using growth charts". There was little or no real promotion of growth, and no explicit interest in child development.

Progress during the seventies

Things started to change around 1970 and growth monitoring became more than just filling charts:

A number of field experiences were conducted, often by NGO's, to take advantage of periodical contacts with the child and the mother, for providing preventive care, treatment when needed, and some amount of nutrition education. A few of these interventions succeeded in reducing mortality and improving nutrition, and have become famous: the "promotores" programme in Guatemala led by Jean-Pierre Habicht (2), the Jamkhed project (3,4), or the Narangwal experiment of Carl Taylor in India (5,6). Reviews of the lessons from such innovative attempts – at the time can be found in Sahn & Pestronk (7) or Beghin & Vanderveken (8).

A common feature of such experiments was that they were staffed with highly motivated personnel and endowed with substantial resources: they were therefore hard to replicate. Their main lesson, maybe, was to demonstrate the importance of comprehensiveness in approaching child health care.

A major contribution to growth **promotion** was that of David Morley in the early seventies, based on an extended experience in Nigeria. In the first place, in his "underfive clinics", he was interested not only in growth, but also explicitly, in the child's health. He also was one of the first to use the **dynamics** of growth to promote it (through counselling the mother and providing care). The evolution of the child weight was more of interest than his position in relation to a standard or to that of other children. The child had to follow his **"Road to Health"**. Health was the target! (9-14). Morley's influence was considerable. Growth charts of all kinds (and colours) proliferated, reference data were passionately discussed until a reasonably good agreement was reached under the auspices of WHO, and an international standard for universal use was adopted (15).

That same year (16) WHO and UNICEF called the Alma Ata Conference – a landmark in the history of public health. Nutrition was one of the eight priorities, and growth monitoring was explicitly recommended.

Yet the health services, in general, were not very responsive, for a number of reasons:

- Inadequate organization of care
- Poor training and supervision of first line health workers
- Lack of clear guidelines for such workers
- Difficulty of treating malnourished children and scarcity of places where to refer them for treatment.

The problem was aggravated by the "selective health care" controversy and its vertical approach (17), and by the promotion of GOBI by UNICEF (18,19). Growth monitoring, as the G in GOBI (the other components being oral rehydration, breastfeeding and immunization) was actually understood as growth promotion. But this interpretation was not applied in the routine of the health services. Using the chart remained mostly a ritual, serving basically as a tool for screening and diagnosis. Both selective health care and GOBI were the opposite of a comprehensive approach.

Anyhow, a positive aspect was that growth monitoring became a widespread practice, the world over.

A time of questioning

The late 80's were a period of putting the practice of growth monitoring into question. A number of articles raised serious doubts. For example Gopalan & Chatterjee (20) and Gopalan (21), or various authors in a special supplement of the Indian Journal of Paediatrics (22), and foremost, Nancy Gerein in a by now classical paper, also in 1988 (23). Nancy Gerein was severely criticizing current growth monitoring practices, showing that their underlying assumptions were not sufficiently founded, and she was pointing to operational weaknesses which explained why growth monitoring couldn't possibly meet the goal of improving growth and development. Pre-eminent issues of organization, planning, etc. were to be addressed first. Many of her criticisms and concerns are still valid today.

Yet, during approximately the same period, a few intervention studies were being conducted, such as the Iringa Project in Tanzania, with UNICEF, or the Tamil Nadu Project in India, with the World Bank. They somehow repeated earlier projects, but they did so in the light of new concepts and experiences – which had been presented in quite a few original articles and reviews published in that period (24,25,26).

I am not going any further inside this more recent period, which no doubt is familiar to all of you, and I rather have a look at where we stand.

Lessons learned

What we have learned up to the mid-nineties, approximately, points in three directions that deserve to be further explored in the field:

1. The advantages of a comprehensive approach.

Comprehensiveness (in promoting growth and development) means:

- That the child is taken as a whole (his growth, his development and his health) and that the full range of preventive and curative care is provided, regardless of the category of problem the child is suffering or exposed to;
- That the child's growth characteristics are seen in their context, which basically is the family hence the importance of involving the parents and caretakers, of knowing their perceptions and representations, of supporting them, and of strengthening their caring capacity.

David Morley was already saying that in 1973!

2. The usefulness and feasibility of **participation**.

Participation, as understood here, means much more than the mere involvement of the parents or the community in detecting growth faltering (or obesity) in the child, and then calling upon the health service. It implies what Dixon (27) called the "devolvement" of health knowledge and skills from the health personnel towards the community. More deeply, it reflects a philosophical attitude of trusting the parents' capacity and it turns away from the too common elitist attitude of the health workers – itself inherited from the doctors. Participation is therefore not only a means, but it is a goal in itself, contributing to the new development ethics of local democracy and self-determination or "empowerment" (28,29).

These are not just theoretical assertions: in the first place participation is feasible (30,31). Secondly those projects where

child mortality was reduced and/or nutrition improved as a consequence of the intervention, had either a comprehensive approach to child health and development, or active participation or both. Some of these projects were mentioned above: what is said here may be their major contribution to our present knowledge.

Yet, for participation to be effective in contributing to better growth and health, parents and community need to be motivated and to learn certain skills. This is where social communication enters

3. The third direction is the potential – insufficiently explored in this area – of social communication.

Any promotional activity, in the field of public health, requires a strong educational component. Nutrition education – in this case education for growth and development – seems to have received little attention from the Colloquium organizers, and maybe we should regret it. The reason, perhaps, is that nutrition education has been, and too often still is, rather ineffective. Yet, new approaches were being developed during the last decade or so, in which conventional nutrition education gives way to the management of social communication (32).

Social communication, as defined by Andrien, is "a set of communication activities (conscious or not) between the members of a given society, which reflect the codes and rules within this society. Such codes and rules are not only powerful determinants of individual behaviour. They also determine that individuals belong to the group, and play a key role in society's cohesion. To intervene in social communication means therefore to change such codes and rules, and change individual behaviours at the population's scale." Nutrition education then is more an intervention integrated into pre-existing social communication, than an external intervention using its own channels and networks. This in turn requires a thorough understanding of values, attitudes and perceptions of the people (This last point, fortunately, is indeed well taken by the Colloquium!).

The overall issue, then, for the health services, is to organize and **manage** such social communication, as Andrien and I were showing in our book (32).

Recent applications of the social communication approach by Andrien and his co-workers from Liège University, and by the Academy of Educational Development in Washington, in areas such as family planning, AIDS prevention, nutrition, etc., strongly suggest that it can be successfully applied to the promotion of growth and development

- To create or strengthen awareness,
- To improve the caring capacity and the self-confidence of the parents,
- More generally, to empower them.

Two personal remarks

Besides the three lessons learned from recent experience, it seems to me that two issues need considerably more consideration. One is an old problem: that of longitudinal growth. Years ago, John Waterlow already insisted on the importance of measuring height (33,34). The second is the emergence of obesity world-wide, and of concern to us here: obesity in the young child.

The implications of these two points for the health services' operations need to be debated and more probably be the topic of future research.

Conclusion

As a result of this overview, I would put seven questions related to the health services on my personal agenda:

 Is growth monitoring important? Indeed, in too many places, even today, it remains a ritual, and the information it provides is not, or poorly used for the real promotion of growth and development, or the detection and management of child obesity. If it is important, why? What should we be measuring: weight? height? both? In spite of earlier work by Rueda-Williamson or Waterlow, we

still tend to focus on weight and overlook longitudinal growth.

- 2. How should the health services approach the individual child comprehensively? What are the operational implications of the requisite of comprehensiveness?
- 3. What should the health services do to stimulate genuine participation and make it real, useful and liberating?
- 4. Is the management of social communication, understood as a dynamic, participatory process, a better answer than conventional nutrition education for empowering the parents and strengthening their caring capacity?
- Hasn't the time come to early detect and prevent child overweight and obesity?
 Obesity – when we think of its long-term consequences – is now a major problem in an increasing number of countries.

- 6. What is child development? How do the different actors perceive it? What does that mean for the health services' operations?
- 7. How do we reach all (or almost all) the children in a community or district?

This essential issue of coverage is necessarily dependent from the existing health system, and raises questions of organization (as Nancy Gerein already showed in 1988).

Answering such questions should allow the health services to count on satisfactory guidelines for the promotion of growth and development, and would assist them in reaching the goal of good health practically, effectively, at an affordable cost, in a sustainable manner – in a wide variety of situations. Most of those questions are operational, and since the mid-nineties they have been the subject of good quality research and experimentation. Quite a few of these researchers are participating in this Symposium. This is why this meeting is relevant and timely. The Colloquium's programme suggests that from our discussions a few answers might well emerge. New questions certainly will! And facing new questions is making progress indeed.

Acknowledgements

The author wishes to thank Dr. Patrick Kolsteren for guidance, insights and references for an earlier version of this paper.

References

- 1. Beghin I, Fougère W, King KW. L'alimentation et la nutrition en Haïti. *Paris: Presses Universitaires de France*, 1970. 248 pages.
- 2. Habicht JP et al. Delivery of primary care by medical auxiliaries: techniques of use and analysis of benefits achieved in some rural villages in Guatemala. Scientific publication no. 278. Washington DC: PAHO, 1973.
- 3. Arole M, Arole R. A comprehensive rural health project in Jamkhed (India). In Newell K: "Health by the People". *Geneva: WHO*, 1975.
- 4. Arole M. A comprehensive approach to community welfare: Growth monitoring and the role of women in Jamkhed. *Ind J Pediatr.* 1988;**55** (Suppl.):S100-105.
- 5. Taylor CE, Kielman AA, de Sweemer C et al. Malnutrition, infection, growth and development: the Narangwal experience. *Washington DC: The World Bank*, 1981.
- Gwatkin DB, Wilcox JR, Wray JD. Can health and nutrition interventions make a difference? Monograph no. 13. Washington DC: Oversees Development Council, 1980.
- 7. Sahn DE, Pestronk RU. Experiences and methodologies in nutrition evaluation: a literature review. *Michigan: Community Systems Foundation, Ann Arbor*, 1979.

- Beghin I, Vanderveken M. Nutritional programmes Chapter 4. In Vallin J, Lopez A (Eds.): "Health Policy, Social Policy and Portality Prospects". *Paris: INED/INSSP*, 1985;81-102.
- 9. Morley D. A medical service for children under five years of age in West Africa. *Trans Roy Soc Trop Med Hyg.* 1963;**57**:79-94.
- Morley D. The spread of comprehensive care through under-fives' clinics. Trans Roy Soc Trop Med Hyg. 1973;67(2):155-170.
- 11. Morley DC. Paediatric priorities in developing world. *London: Butterworths*, 1973.
- Morley D. The design and use of weight charts in surveillance of the individual. In: Beaton GH and Bengoa JM (Eds.): "Nutrition in preventive medecine". *Geneva: WHO*, 1976;520-529.
- 13. Cunningham N. The under-fives clinic: what difference does it make? J Trop Pediatr Environ Ch Health. 1978;24:239-334.
- 14. Morley D, Woodland M. See how they grow: monitoring child growth for appropriate health care in developing countries. *London: Mc. Millan*, 1979.
- 15. World Health Organization. A growth chart for international use in maternal and child health care. *Geneva: WHO*, 1978.
- World Health Organization. Primary Health Care. Report of the International conference of Primary Health Care. Health for All Series no.1. *Geneva: Alma Ata*, 1978.
- Walsh JA, Warren FS. Selective primary health care: an interim strategy for disease control in developing countries. *New Eng J Med.* 1979;18:967-974.
- Grant JP. Une révolution en profit de la suivie et du développement des enfants. Carnets de l'Enfant. 1983;61/62:21-33.
- 19. Grant JP. Going for growth. In: "State of the world's children". Oxford: UNICEF and Oxford University Press, 1987;64-80.
- 20. Gopalan C, Chatterjee M. Use of growth charts for promoting child nutrition: a review of global experience. Special Publication Series no.2. *New Delhi: Nutrition Foundation of India*, 1985.
- 21. Gopalan C. Growth monitoring some basic issues. NFI Bulletin. 1987;8(2):1-4.
- 22. Indian Journal of Pediatrics. 1988;55(Suppl.).
- 23. Gerein N. Is growth monitoring worthwile? Health Pol Plann. 1988;3(3):181-194.
- 24. Maire B. Suivi et promotion de la croissance. In: Marek T (Ed.): "Comment améliorer la contribution du secteur de la santé dans la lutte contre la malnutrition". Note technique no. 11. *Washington DC: Banque Mondiale, AFTHR*, 1993.
- 25. Tonglet R. Surveillance de la croissance et prévention de la morbidité du jeune enfant en milieu rural africain: éléments d'évaluation épidémiologique. Thesis. *Université Libre de Bruxelles*, 1994.
- World Health Organization. A critical link: interventions for physical growth and psychological development. A review. Doc. WHO/CHS/CAH/99.3. Geneva, 1999.
 Dixon RA. Monitoring the growth of the World's children. Ann Trop Paediatr.
- 27. Dixon RA. Monitoring the growth of the World's children. Ann Trop Paediatr. 1991;**11**:3-9.
- 28. Drèze J, Sen A. Hunger and Public Action. Oxford: Oxford University Press, 1989.
- 29. UNDP. Human development report. Oxford: Oxford University Press, 1991.

- Lefèvre P, Kolsteren P, De Wael MP, Byekwaso F, Beghin I. CPPE: Comprehensive Participatory Planning and Evaluation. Rome: Institute of Tropical Medicine and Belgian Survival Fund Joint Programme. IFAD, 2001. 54 pages.
- 31. Andrien M. Les interventions dans la communication sociale en nutrition. *Rome: Food, Nutrition and Agriculture, FAO,* 1994;**10**.
- 32. Andrien M, Beghin I. Nutrition et communication. De l'éducation nutritionnelle conventionnelle à la communication sociale en nutrition. *Paris: L'harmattan*, 1993.
- Waterlow JC. Classification and definition of protein-energy malnutrition. In: Beaton GH & Bengoa JM. "Nutrition in preventive medicine". *Geneva: WHO*, 1976.
- Waterlow JC. Prevention of protein-energy malnutrition. In: Waterlow JC, Tomkins AM, Grantham McGregor SM, Edward A (Eds.): "Protein energy malnutrition". London, 1992.

EARLY CHILD DEVELOPMENT: SHOULD WE HAVE GLOBAL INDICATORS?

Patrice Engle¹

Defining child development

Child development refers to the ordered emergence of increasingly complex abilities of thinking, communicating, moving, feeling and relating to others. For example, we know that with increasing age, children are able to recognize that other people have different ideas from theirs; the child has to develop a theory of what a mind is. As with growth, although we may characterize children according to their status at one point in time, we are searching for measures that reflect the velocity and rate of change, and the dimension in which the change occurs. Change occurs in many dimensions of development, such as language, cognition, emotion, For each dimension the pattern of and social competence. emergence may differ, so that progress in one domain may be more rapid than in another for periods of time. Timing may differ from child to child but the sequence of emergence of abilities within a dimension is fixed.

Recently the term "integrated child development" has been introduced to incorporate physical growth, health, and biobehavioural development as factors that influence individual competence. These behavioural factors include cognitive skills, temperament/personality, motivation, self-perceptions, and interpersonal style. The term "integrated" suggests that a child develops holistically; the links between physical growth and psychosocial development are complex but interlinked. A child who is poorly nourished or chronically ill is less likely to have the energy or interest to explore and learn. A healthy and well-nourished child in a stimulating environment will be more likely to profit from the experiences for learning.

Black (1) defines child development as "the adaptational processes that occur as children acquire increasingly complex skills and are socialized into the roles, rights, and responsibilities of society. The most rapid period of development is the first three years of life, as children acquire skills across multiple areas". The acquisition of skills in fine motor development illustrates the process. New-borns have a grasp reflex, but lack functional eye-

¹ Child Development and Nutrition, UNICEF, New Delhi, India

hand co-ordination. During the first year of life children gain increasing control over their hands, such that by approximately 12 months of age, many children can pick up small objects and begin to feed themselves with their hands. By three years of age, children can feed themselves independently with utensils and can draw simple shapes.

The stages of emotional development are less well known. At birth children's expressions of emotions are limited to cries. Through interactions with caregivers, children's understanding and expressions of emotions become differentiated. By three years of age, most children are able to interpret and express a range of emotions in themselves and others, including happiness, anger, hunger, and distress. Similar patterns can be defined for social development, referring to the relationship of child to others, cognitive development, language, and perceptual development.

These abilities emerge in a constant interaction with the environment; indeed, at least 50% of the variance in child abilities can be attributed to environmental factors. Black (1) describes the process as a *transaction* in that the development of the child is influenced by environmental factors (e.g., warm and supportive relationships resulting in a more self-confident child) and in turn these child characteristics affect the environmental conditions (a confident child will explore more and try out more actions, resulting in higher confidence). A negative cycle can also occur; a malnourished child is less responsive to care, receives less attention, feeding and food, and in turn becomes more malnourished. An environmental intervention, such as someone patiently encouraging an anorexic child to eat, can break the negative cycle of decline.

Principles of the developmental process

What have we learned about the process of child development? Over the past 50 years, research primarily in industrialized countries has led to some important generalizations:

- A child's bio-behavioural development is function of the interaction of genetic influences and experiences, and is influenced by biological factors such as nutritional status and health status.
- The most rapid rate of development occurs in the first few years of life, and during this period, children are most vulnerable to risks in their physical and social environment.
- There are several ways in which risks in the first few years of life will affect later development. Research shows that early

positive experiences help to protect the child in later stressful events, increasing resilience. Early negative experiences may leave the individual more prone to later stressers or less able to profit from positive experiences. Investigators have also identified examples of "steeling" in which early negative experiences followed by family support can make an individual more able to resist later negative events.

- Protective Factors:
 - ✤ A close relationship with one or more caregivers in the first year of life (secure base phenomenon); these children are more likely to be confident and competent in later life.
 - ✤ A close relationship during early childhood; fathers can have significant positive impacts on children.
 - Caregivers who are both nurturing and directive (i.e., are clear in their expectations, listen to their children and provide information in a nurturing manner with warmth and respect); their children are usually confident and competent. These children receive clear guidance, they know the consequences of following or not following the expectations, and they feel warmth and respect from their caregivers (1).
- Verbal interactions with adults, particularly in the second and third years of life, appear to be a crucial antecedent of early language development. Better language skills are related to better school performance.
- Early interventions have the potential to alter poor children's achievement they have larger effects in the short term than other kinds of human services. The earlier the intervention, the more effective but if the child returns to an impoverished, not stimulating environment with an unresponsive caregiver, the gains will not be sustained (2). This improvement appears to be due in part to children's acquisition of social skills.
- Both social and cognitive development is important for child's later development but we know much less about social and emotional development.
- Children develop in a cultural context and it plays a major role in how the child develops.

Child development in cultural context

Although the findings above are presumed to be generic, the last point underscores the need for examining cultural differences in childrearing practices and beliefs. It must be recognized, however, that culture is not static; it is a constantly changing set of beliefs and meanings that have varying effects on behaviour. It is generally accepted that cultural differences in the way communities think of children, their goals for children, and the opportunities that they provide for learning and for becoming part of a community result in very different forms of development.

In societies that value early motor precocity, as in parts of East Africa, children sit and stand far earlier than children in other parts of the world. Are these differences genetic or a result of parental teaching and interaction designed to support a particular goal? How robust are these differences compared to the remarkable similarities in all cultures in the course of development, such as the emergence of the social smile at six weeks, awareness of the sense of self around 18 months, and development of syntactic structures by 2 years of age? This issue is particularly pertinent when we consider the possibility of developing measurements of child development that would have validity across cultures.

The key issue is whether there must be different kinds of assessments for each culture, or whether there is some possibility of a generic measure for global advocacy, in addition to local and national measures. There are some suggestions that goals for children can generalize across cultures. For example, following a careful qualitative study in four rural villages of Nepal, Arnold concluded that despite the circumstances, children must "grow up healthy, well-nourished, protected from harm, with a sense of selfworth and identity, and enthusiasm and opportunities for learning; and that they learn to think for themselves, communicate effectively, get on with others, and play an active role in their families" (3 p. 36). She suggests that all children have rights to these conditions of development, not that there are cultural differences that proscribe certain children to one set of goals as opposed to another.

On the other hand, others argue persuasively that cultures will differ in the kinds of abilities and skills that they support, and their values for children. In India, for example, Viruru (4) suggests that Indian assumptions about childhood differ significantly from Western notions, leading to different outcomes for children. The Western theory sees the child as a logical thinker and learner, as a budding scientist actively pursing learning. Recommendations are for "developmentally appropriate practice", since the child has different ways of thinking at different ages; and learning occurs through experimentation and play. The recommended "Western" method of discipline, she argues, is that the child is taught to master herself, to learn through repeated experiences to control herself.

On the other hand Viruru sees the Indian child learning in a different way - the child must master complexity and ambiguity in her social sphere; learning occurs by repeated action, through songs and stories. Discipline is administered by threatening child with being separated from the greater whole, the ultimate loss. The child is assumed to be a creation of parents and gift from God both human and divine, and born with fixed and unalterable propensities, although the child's initial nature can be transformed by rituals. The child is part of the family collective space - not necessarily "brought up" but "lived with". Social relationships are defined by high tolerance of ambiguity; Viruru comments that "ambiguity is crucial to all kinds of understanding between human beings" and adds "probably one of the reasons that so much in Indian culture seems ambiguous is the refusal to put things into words. Words are for the unimportant things in life". Abstract rules are not described, and there is little explicit praise for children. Gender, however, determines all phases of the socialization process

Can the same assessment tool be used for these two contexts, in which achievement is measured by different behaviours – social sophistication and ability to read social cues in one, and manipulative cognitive thinking in another? How much do these differences reflect social class differences, and variations within a culture?

One approach to define a child's abilities is in terms of the child's competence in a particular eco-cultural setting (e.g., rural agricultural, small trading, large urban area, etc.). Wachs (5) has defined development in terms of the child's growing competence. He defines competence in terms of "one who can effectively adapt to and interact with his or her environment – or the ability to meet major developmental goals viewed as appropriate for a given individual at a given age in a given context, as well as coping with environmental challenges" (5). This definition would result in an infinite number of definitions of competence, which would be theoretically sound but practically not very useful. This definition acknowledges the need to learn to adapt to conditions of rapid change, such as urbanization, in which new competencies may be required during the course of growing up.

Another approach is to examine patterns of childrearing according to the goals parents have for their children, determined

by their livelihood systems. For example, Levine et al. (6) postulate that parents' livelihood strategies have a significant effect on their child rearing practices. Parents have different investment strategies for their children, depending on the child's role in livelihood. In rural, agricultural communities, parents may value child obedience and loyalty; parents want many children to survive, but once survival seems ensured, children become part of the "culture of children" and have relatively little interaction with parents. They may play a significant role in livelihood production and become important family members.

On the other hand, parents who perceive that the success of their children will be related to schooling and consequent employment have a different set of investment strategies; they may tend to have fewer children, investing in each more heavily, and value ability to learn more than obedience. These parents might tend to spend more time with their children in the second and third years of life, contributing to higher levels of language acquisition, whereas the first group of parents invested most heavily during on the earliest period of infancy to ensure survival. Children raised under each of these circumstances will develop slightly different sets of skills and abilities; the former could excel in procedural skills, learning how to do things by careful observation and memory, whereas the second might have more developed language and logical thinking skills. Which is more valuable depends on the kinds of demands that the culture has for children.

These arguments suggest that although culture is an extremely important dimension of childrearing, it must be seen as dynamic and changing. Parental values of childrearing depend on the economic and social conditions of the family. Many cultural groups, particularly in agrarian societies, value obedience and loyalty, and respect, and expect children to learn through the nonverbal observation of adults. For example, in a "value of children" study in 9 countries in the 1980s, "obeying their parents" was the most valued characteristic in four countries (Indonesia, Philippines, Thailand and Turkey (60%), while "being independent and self-reliant" was chosen by only 18% in Turkey (7 p. 42). However, as expectations for child performance change, with urbanization and universal schooling, these values may change as well, and the implications for what one is to measure will also change.

Global indicators of child development: What might be the advantages?

The section above clearly indicates the difficulties in defining child development in a global context, and emphasizes the importance of respect for local norms, values, and customs of childrearing. However, there are two major changes in the past decade that would suggest the possibility for developing some form of global indicator. The first is the global acceptance of a rightsbased approach to children. The second is the rise of universal schooling in many countries, which might suggest that all children need similar skills for school success.

The Convention for the Rights of the Child prepared in 1990 is now ratified by 192 countries (all but 2). According to the CRC, every child has the right to develop "to the maximum extent possible". Article 6 supports the child's inherent right to life, and states parties shall ensure to the maximum extent possible the survival and development of the child. Further clarification of this item appears in the guidelines for periodic reporting. States (countries) must describe measures taken to "create an environment conducive to ensuring to the maximum extent possible the survival and development of the child, including physical, mental, spiritual, moral, psychological, and social development in a manner compatible with human dignity, and to prepare the child for an individual life in free society."

Other articles also speak about rights related to a child's development, and to the obligations of countries to support families to ensure these rights. Articles 5 and 18 enjoin States Parties to respect the responsibilities, rights and duties of parents to provide, in a manner consistent with the evolving capacities of the child, appropriate guidance to the child in exercising his rights as established in the Convention (8). Article 18 makes both parents responsible, and requires States Parties to render appropriate assistance to parents and legal guardians in performing childrearing duties and shall ensure the development of institutions, facilities and services for care of children, making specific mention of working parents' needs for child care. Article 27 enjoins States parties to recognize the right of every child to a standard of living adequate for the child's physical, mental, spiritual, moral and social development". These statements guarantee the rights of all children, not just ones from rich countries, to optimal development.

Based on the CRC a series of 25 goals were established, and the past decade has seen the countries of the world rally around

these goals. with reports on the mid-decade goals and a final "End-Decade Report" in 2001. Setting these goals and holding countries accountable for their achievement focuses attention and investment to achieve the goals. Yet in these goals, there is no indicator of the child's development. Initially only one of 25 goals referred to development: "to increase early child development activities, inducing appropriate low-cost interventions based in the family and the community". However, when the list of goals was reorganized into seven Principal Goals for the World Plan of Action, no specific goal for child development was mentioned. The key measures included under 5 mortality, maternal mortality, child malnutrition, and micronutrient malnutrition. During the decade, relatively little investment went into improvement of early childhood development, compared to health and nutrition.

Was this because there were no globally accepted measures? Perhaps so; Myers (9) argues that "this failure (to have child development as part of the debate on improving human development or of monitoring the developmental progress of nations) is related at least in part to the failure to agree upon appropriate measures of what constitutes early childhood care and development" (p. 25). Similarly, as De los Angeles-Bautista (8) comments, " it is imperative that we monitor national plans of action and implementation targets to make sure young children do not disappear (p. 10).

A second argument for global indicators of child development is the increasing demand for universal schooling. This right, also enshrined in the CRC, has changed the kinds of demands on children. Although access to school has been the major goal in the past, the new Millennium Development Goals are calling for primary school completion to be the key outcome indicator. This change represents a new focus not only on access, but also on persistence and by inference, on school achievement.

Is school culturally determined, so that children require different kinds of preparation depending on the cultural context? Many cultures traditionally had models of schooling in which children learned from a non-parent, but the content of learning may have been the ways of doing things – procedural learning, rather than abstract learning. However, most schools now teach reading and mathematics, which require cognitive-linguistic intelligence and ability to handle abstractions. In many schools, memory (often primarily auditory memory) is the cognitive skill most related to achievement (10). Yet even when schooling is based on rote learning and memory, there may be benefits from school learning as opposed to learning "how to do things" outside school. For example, one recent assessment of the mathematics skills of non-
schooled street vendors in Brazil suggested that even though they were adept at arithmetic, they did not learn the abstractions necessary to understand mathematical systems which schooled children from similar backgrounds did (7). Schooling also develops similar social skills globally – they learn to adopt a learner role and have contact with non-family members (strangers), both other children and adults.

Turkish author Kagitcibasi (7) rejected the idea that schools should vary by the culture and economic circumstances. She argues that by "not using comparative standards and not passing judgements (making value judgements) about the state of the children in the pre-industrial society, ironically, a value judgement is being made by default. This value judgement states that in the industrial society with mass schooling (universal), cognitive standards of achievement apply, but in pre-industrial societies they do not. What we have here is relativism leading to double standards "(p. 109).

Increasingly for children to benefit from globalization and urbanization they will need to learn to adapt to new situations, a skill which has not been addressed in schools to this time. In many parts of the world, globalization has resulted in increased income discrepancies, resulting to greater impoverishment of the poor (11). Yet world leaders do not argue for an end to globalization, but a greater openness to it (11) and an increased investment in human development.

Thus there are two reasons that we may need a global indicator of child development: preparing children for universal schooling and fulfilling children's rights. How can countries be encouraged to invest in preparing children for school success, rather than only focusing changing schools to ensure access? If we had an indicator such as "% children below normal development for 3 years of age" across the countries, then countries could evaluate how they stand compared to others, and track the quality of the environment that is being provided to children. They could evaluate expenditures and make decisions about the value of greater investment in terms of effects on child development. They could also link improvements in health and nutrition to improvements in child development.

The barriers to having such an indicator are formidable, including how to define an indicator that is applicable across countries, how to respect local differences in child development, deciding how and who will be able to assess this information and how it should be used.

Experiences from the field of nutrition provide relevant lessons. The significance of malnutrition was first recognized in its

most "florid" forms – blindness due to vitamin A deficiency, scurvy from vitamin C deficiency, kwashakior from protein deficiency, and the severe wasting associated with the combined protein-energy deficiency. About 40 years ago there was a growing recognition that mild and moderate malnutrition might also have negative impacts on growth and development. But how should this be assessed? Initially a large number of measures of the body were taken – height, weight, head circumference, mid-arm circumference, knee to heel ratio, etc. After several decades of research, it is commonly accepted that height and weight are the best indicators – and height is in fact the most sensitive indicator of possible cognitive consequences for children.

Similarly, the measurements had to be normed - had to be compared to some yardstick so those children in one area could be compared to another. In the absence of other global alternatives, the normative data chosen were those from the largest database of growth data, that collected in the United States (National Center for Health Statistics). But many countries continued to use norms from their own countries. A strong challenge to universal norms was launched by Seckler in 1989 (12), who argued that norms must be based on national reference groups, rather than on an international standard. He argued in an article "Small but healthy" that if one used national norms, the rate of malnutrition would decline; in India, rather than having 60% of children malnourished, the percent would drop to a mere 10%.

A storm of protest silenced this argument. The protesters argued that in any population, the well-off group grew to approximately the same height as the US norm. Further, studies on the effects of malnutrition on mental development were showing that even mild malnutrition had negative effects on a child's cognitive development. Thus the idea that there should be international standards was gradually accepted. The argument has a final phase; at this time, WHO and UNICEF and other partners are assessing the growth of well-nourished populations in six countries to establish internationally acceptable norms of growth. But the development of this consensus was a long slow process, with investment by many actors to arrive at the conclusion.

Other measures have also required intensive effort to define. Assessing breastfeeding, which from the outside seems to be straightforward, has been the subject of debate and controversy for a number of years. Could a similar process be envisioned for child development?

Global indicators of child development: What might be the drawbacks?

As noted above, a major difficulty in defining a global standard is that it defines the achievement of all children in terms of one standard. Values for a child's development differ by culture, which can be at national, class, caste, or local level. Thus it is difficult to have a universal definition of child development since we must accept and preserve differences in cultural definitions of early child development" (13 p. 25).

A second problem is to decide which skills are to be measured. The age of the child at assessment will determine what is assessed; prior to age one, both motor and cognitive functions tend to be assessed. Before three, language and cognitive skills are emerging, but until 2 years of age they are not generally very predictive of later development. By age 3, verbal and cognitive skills are fairly well developed, so a more consistent set of measures can be assessed. Pre-reading and pre-writing skills can be assessed in a child at 4 or 5, but these tend not to emerge earlier.

Assessing young children requires a highly skilled tester in order to be sure that the child is showing what he or she really understands. Many investigations therefore rely on parent report, which tend to be somewhat unreliable, and may differ according to the parents' own understanding of the questions asked, or their observational skills.

What kinds of norms should be used – global, national, or local – is a problem with child development as it had been with anthropometry (measures of growth). Finally, and most important, if the testing is not done well, or the testing instrument is flawed, the danger of mis-diagnosing and miss-classifying children must be of paramount concern.

Different kinds of assessments serve different purposes

In order to simplify the situation, we need to recognize that a global assessment of child development may not need the same kind of rigor as individual-level assessments of children. We need a number of different kinds of assessments, most of which do not need international standards. Nor do they all measure cognitive development; for each purpose, indicators of social and emotional development could be recommended. Examining these multiple uses may help understand the very limited role a global assessment might have. Three main purposes of assessment can be defined.

Individual level assessments must be made very accurately in order to assure appropriate interventions for children. They have to include assessment of enough dimensions, and with enough different items, to be sure that the assessment is reliable and valid for that particular child. Uses of these indicators might be:

- Screening tools for assessing which children are at risk of disabilities or delays
- Individual child assessment for educational and therapeutic interventions clinical assessments
- Assessments of children's readiness for school, an "achievement" test;

A second group of assessments are those designed to compare children within a particular social context – either for research purposes – identifying factors associated with child development improvement, evaluating interventions, or for programme evaluations – to assess what works under which conditions, and with which kinds of children. In this case, the measures can be developed according to the particular goals of the programme and the local context, and need not be comparable across cultures. This assessment may or may not require individual-level reliability.

The third kind of assessment is to evaluate achievement of internationally defined goals and objectives. These need not be individual-level measures, but must reflect at a population level both the capacities of children and the broader context of care. Thus it may be possible to evaluate a larger number of children on fewer skills, which will provide a population level measure but could not be used to diagnose or classify a particular child. Parental report might prove more valuable for this effort, if questions can be devised to assess what they are observing about their children.

Approaches that have been followed for the development of measures of child development include the following, which may meet one or more of the three goals above:

Adapt a western-developed scale: In this case, a welldeveloped scale from industrialized countries is adapted to the cultural context through changing language, items that are culturally biased, the kinds of responses that might be expected, the testing situation, and finally the norms to be used as a standard.

This is commonly followed strategy research and evaluation, and often for individual assessments, since they are harder to develop at the local level. For example, for infants, the Bayley Scales of Infant Development are widely used, but they are difficult to use on a large scale, requiring careful training of the tester and a 1hour assessment per infant.

Develop a culture-specific scale that is normed within the culture and assesses learning valued in that culture. In Latin America, a number of screening tests have been developed that are used for screening and for assessment. In Kenya the African Child Intelligence Test was developed. These measures can be used to meet the first two purposes.

Developing a scale that is designed to assess a specific outcome or criterion. A number of countries have tried to develop tests that would predict how well a child will do in school (specific outcome) before school entry. These measures are within country assessments, and can prove very useful for well-defined purposes, as they assess what will be related to an outcome. Unfortunately there are few of these for younger children, since establishing the link to education takes more time, but is not impossible.

Dynamic measures: Measure learning rather than achievement. A number of researchers have suggested that the best measure of a child's IQ is her ability to learn in the course of doing a task. In other words, the child is given a problem to solve, and how well (and perhaps how quickly) the child solves the problem is the indicator of the child's potential ability. This concept is appealing, but much work needs to be done to be sure that the particular task and learning requirements are culturally appropriate for the child.

Develop country-specific norms for milestones of development. This approach began as an effort to create a countryspecific screening test. The idea is to assess norms for each country of common childhood "milestones" (e.g., sitting, standing, reaching for an object, naming four objects) and to develop locally appropriate milestones that reflect valued achievements in that culture. In the 1980s a large-scale project to develop these norms was undertaken by WHO in three countries. All countries assessed the age at which children could do a set of core indicators, based primarily on the items in the frequently used Denver Developmental Screening Test, and countries could develop unique indicators. The plan was to use these country-specific norms for constructing screening tests that would later be used along with growth cards for universal screening for disabilities that would include both universal and national items.

Testing of large-scale samples was done in three countries: India, Thailand, and China. Passing rates for individual items were generally consistent in the three countries, and rural-urban differences began to appear around 18 months (with language items in particular). Some items differed widely among countries, such as age of drinking from a cup, but that difference may reflect the difficulty in being sure that the same behaviour is being assessed in each place (e.g., does the cup have a handle? Does the child have to hold with two hands, or with a handle, which is much more difficult?).

Currently, a similar effort is underway by WHO, but on a more limited scale. In 5 countries, the age at which well-nourished middle class children achieve 6 motor milestones is being assessed. This exercise was proposed for other milestones, but this was deemed too ambitious for the moment. It will provide the basis for creating some universal norms at least for these motor indicators.

If this approach were generalized to a larger number of indicators, one could envisage a measure that would assess the percent of children who pass a certain milestone at a defined age (or pass 4 to 5 indicators). This would provide a population measure of child development without having to label any particular child, and would allow comparisons between countries. It is possible that each country could define those indicators most appropriate for them based on norms from healthy and well nourished populations in their own countries, and then be able to assess percent of children passing these norms.

Assessments of policies, services, and the learning environment: Finally, some investigators have suggested that rather than measuring the child, one can assess the conditions for the child – coverage of services, policies, etc. The EFA assessment (UNICEF/UNESCO 1997) recommends two main indicators: % children of any age (or 3-5) in organized preschool; % children entering first grade who have some experience in preschool. Myers (13) suggests that these are unsatisfactory because there is no consistency in the definition of the terms, and the figures are often not well reported.

The Consultative Group for Early Childhood Care and Development/UNICEF approach tried to assess a minimum set of indicators for early childhood development at the national level. They worked with five countries and finally developed a list of 16 indicators plus an evaluative standard for assessment. These include:

- Coverage, access, and use both pre-school enrolment and parent education programmes
- Programme quality child/teacher ratio, teacher qualification, physical environment, curriculum or assessment of class interaction
- Political will policy and financing

- Cost/expenditure
- Effects on children
 - child developmental assessment
 - school readiness cognitive and social skills as well
 - nutritional status
 - health status
 - parental knowledge and expectations

For any organization that wishes to improve the development of children at a global level, and give them the best possible start in life, informing key decision-makers about their country's progress and how they compare to other countries is a key advocacy strategy. For this reason, having some form of indicator would be of great value. But it is a goal that remains elusive. Currently in UNICEF a new medium-term strategy has been developed, integrating health, nutrition, water and sanitation, protection and early learning. This initiative will be evaluated on the basis of:

- success in putting integrated child development policies in place,
- defining nationally agreed upon indicators of psychosocial and cognitive development based on local research in at least 6 countries, and
- Improving parenting care practices in a number of areas, including psychosocial care, feeding, care for the child with diarrhoea, and handwashing.

Conclusion

The development of internationally agreed on standards and scales for assessing child development is a significant challenge, but one that could have a substantial effect on international policies. The benefits would be seen in countries' ability to monitor their progress in their national plans of action, to compare their results with other countries, to determine the effects of investment in early childhood, and to increase the priority given to early childhood development at a global scale. "You measure what you treasure." At this point there are efforts to define indicators that can be agreed upon at least nationally, and eventually there may be international standards. We need to include measurement of policies, services, and care practices and environment, in addition to assessments of the child.

We also need to distinguish to purpose of the indicator, so that the approach to assessment will be most appropriate for the purpose. The best approach for an international indicator may be to define a set of core indicators or milestones, and calculate the percent of children who have achieved them by a certain age – rather than defining a test score for each child. The milestones to be used could vary from country to country. Eventually the relation of these measures to key economic indicators, such as productivity of the population or school completion would be key criteria for continuation.

References

- 1. Black M. Transactional Analysis of Early Child Development. Presentation at the International Conference on Early Child Care for Survival, Growth, and Development. *New Delhi, India*, 2000.
- 2. Brooks- Gunn J. Do you believe in magic? What we can expect from early childhood intervention programmes. Paper presented at a research briefing on Early Childhood Intervention programmes: Are the costs justified? May 10, 2000, Subcommittee on Human Resources of the US House of Representatives Committee on Ways and Means. *Washington DC*, 2000.
- Arnold C. Brining up children in a changing world: Who's Right? Whose rights? Conversations with families in Nepal. *Early Childhood Matters*. 2001;98(6):40-44.
- 4. Viruru S. Early Childhood Education: A postcolonial perspective. *New Delhi, India: Sage,* 2002.
- 5. Wachs T. The nature of child development. *Food Nutr Bull*.1999;**20**(1):4-22.
- 6. Levine RA, Dixon S, Levine S, Richman A, Leiderman PH, Keefer CH, and Brazelton TB. Child care and culture: Lessons from Africa. *Cambridge, UK: Cambridge University Press*, 1996.
- 7. Kagitcibasi C. Family and human development across cultures: A view from the other side. *Mahweh, New Jersey: Lawrence Erlbaum,* 1996.
- 8. De los Angeles-Bautista, F. Rights from the start: ECD and the Convention on the Rights of the Child (CRC). *Early Childhood Matters*. 2001;**98**(6):8-21.
- 9. Myers RG. In search of early childhood indicators. Coordinators' Notebook, No. 25. 2001;3-31.
- Pollitt E, Gorman KS, Engle PL, Martorell R, Rivera J. Early supplementary feeding and cognition: effects over two decades. Society for research in child development. Monograph Series No. 235. 1993;58:1-99.
- 11. Mahbub ul Haq Human Development Centre. Human development in South Asia 2001: Globalization and human development. *Karachi, Pakistan: Oxford University Press*, 2002.
- 12. Seckler D. Small but healthy. 1989.
- 13. Myers RG. Moving from promises to action: A critique of the CRC from an ECD perspective. *Early Childhood Matters*. 2001;**98**(6):22-24.

MALNUTRITION : A SUBJECT-MATTER FOR ANTHROPOLOGY ?

Dorris Bonnet¹

I want to thank the symposium organizers, especially Professor Kolsteren for his invitation to this event. This symposium proves a real will for a global understanding of the medical care of children suffering from malnutrition in developing countries.

The programme of these three days shows that malnutrition is part of a reflexion on the growth and development of children as a whole.

This point of view is most appropriate to reach the operational aims and elaborate advice that can take into account the constraints as well as the different contexts, we are all working on.

My experience is Africanist and let me shortly introduce myself. I'm an anthropologist. I have been working for many years in Burkina Faso, since nineteen seventy-five as a student and finally since nineteen eighty-three at the Institute of Research on Development. As early as nineteen seventy seven, I worked with Dr Anne Retel-Laurentin who was leading research on women infertility, at a time when it was difficult for the funding bodies to subsidize surveys on the struggle against women sterility, as many of them had a lot of children. That was in the late seventies.

So, I immediately worked with doctors, on the theme of women and child health.

Finally, I will add that it is very useful for an anthropologist to work with a medical staff and not only near the population.

This approach enables us to understand and analyze the misunderstandings, the tensions between one another. If a good relationship between the medical staff and the patients is not yet a claim from the Southern patients, we know, nevertheless, that it determines widely the compliance of sick people.

When doctors and nutritionists request social science researchers on malnutrition, the first observation is the difficulty for the mothers to link the child's state of health and his nutritional state.

From this point of view, the anthropologist can explore different levels of explanation and research on malnutrition.

We can work, first, from the families points of view, and then from the medical staff's.

¹ Institute of Research for Development, Paris

At last, we can also study the gap between one and the other, and even the failure of the public health system.

My purpose, to day, is to sum up the different approaches used by anthropologists in the study of malnutrition.

On the family side, the anthropological surveys have stressed the child's conceptions, the interpretation of his diseases, of his development, and of his death.

They have, also, explored the social management of food in the family, mainly the access to resources, breastfeeding, weaning, getting to the family dish, the ways in which siblings share available food, and so on.

The main idea, regarding the representation of child development from the families' point of view is that **the child is an actor of his development**.

This perception of the child is considered by health workers as a difficulty in the understanding of the mothers' behaviour. Actually, the child is expected to ask for food and if he doesn't, the mothers don't oblige him, for fear the child will go to " the other world ", as the customs says. Child is seen as a vulnerable person, who mustn't be bothered because he is able to pass away.

All the mothering practices are influenced by this perception of the child. A weaned child proves he wants to stay in this world. Till the weaning, the child is protected, comforted when he is crying, never scolded; whereas once he is weaned his education will become hard and sometimes violent.

The child goes from an ideal relation with his mother to a severe up bringing education. This perception of child development determines the interpretation of his disease and death. From pregnancy to weaning, the symptoms of the child reflect family conflicts and tensions. The biological body becomes the metaphor of the social body. The parents have to identify these social forces, struggling inside the body of their children, to cure them.

Thus, disease and death are caught in a religious representation of the world.

In daily life, people don't always systematically refer to this kind of explanation of the disease. They, often, use popular medical words to explain the state of health of their children.

Anthropologists have tried to know if malnutrition is expressed by specific words relating to a medical reality or a cultural model of interpretation.

Even European doctors, as you know, have borrowed a local Ghanaian term to call this disease. So, kwashiorkor seems to be the first name given to the second child after the death of the oldest. We can, also, think of the expression "weaning disease", very popular in Africa. In central Africa, this disease is called "the red children disease", referring to the red hair of some of these children.

Actually, malnutrition has traditionally been perceived as a disease by population and by doctors as early as the forties.

All of them linked illness and weaning – according to Doctor Williams in nineteen thirty two who called this disease " the one the child is suffering from when he is evicted from the maternal breast – but for the first ones the disease come from a lack of milk or a bad milk, and for the other ones, it comes from a lack of solid food.

For these populations, the problem comes more from breastfeeding than solid food diet. Besides each child owns his mother's milk. Therefore, if the woman is pregnant again, she will suddenly stop breastfeeding to the detriment of the oldest. This statement tends to show that the improvement of malnutrition requires the improvement of family planning.

Having said that, for us, it seems illogical that some African populations would call malnutrition " the weaning disease " and, at the same time, not link loose of weight to lack of food on nutritional deficiency.

In fact, the populations regard their children as ill and not as ill-fed.

Nevertheless, the approach of malnutrition only in terms of cultural criteria without an analysis of public health can be dangerous. Why? Because, the reasons of the problem, in a cultural analysis, could be considered through people's way of thinking and not through their way of life.

By "Way of life "I mean not only wealth status of the family but also school level, the range of the child in the family, access to medical care and psychological problems of mothers (for example, I think of teenagers pregnancies, women left alone, HIV positive women)

It is dangerous to tackle the problem on a mere culturalistic approach because the health care workers will persist in thinking they have only to change the state of mind of people and not the public health policy.

Furthermore, we live at a time when people, even in the villages of Africa, are moving and changing.

In spite of this, I don't mean we mustn't be interested in traditional meanings, beliefs and practices. Not at all. Traditional explanations of diseases and local terminologies must be known to understand some behaviours and they also reveal a strong will of surviving and the permanent fear of a lineage without descendance. And these ethnographic statements enable us to think people are not so fatalistic as some would believe. Anthropologists' surveys also consider mother's behaviours when the child is sick. I am referring to therapeutic recourses.

What are the different reasons why women go so late to the hospital and what sort of symptoms alert them?

There are, in fact, two main levels to consider:

First, the question of recourses to medical care in general and particularly in case of malnutrition.

Second, the perception of risk and seriousness for the mother. $% \left({{{\left({{{{{{}}}} \right)}}}_{i}}_{i}} \right)$

We know that **fever is the first sign of worrying and consulting**. A simple diarrhoea does not lead to hospital, even a loss of weight in sub-Saharan. Diarrhoea is a domestic concern.

It's important to study the different stages of illness, from the slightest to the most serious, according to the family. A kind of social dramatization seems to be necessary to bring people to a consultation. By social dramatization I mean a series of events in the family focused on the child symptoms.

At the consultation, women expect a special medicine for their child's disease and the medical staff tries to explain to them they have to change their feeding behaviour. So, the medical answer doesn't fit the expectation.

But, even if the nursing team knows the social conditions of sharing food, they forget this knowledge and put forward their medical culture. Furthermore, after weaning, mothers do not control the food portion.

Let me tell you an anecdote about it.

I must admit that without meat and eggs, I had a difficult personal problem to solve, when I was a young researcher, living in an African family. I was very often tired and weak. At last, I bought a lamb's leg which I gave to the wife in charge of the cooking and I imagined at least a few cooked pieces of meat would be given back to me – naïvely or selfishly, it depends on which side of the desert you are -. Every time, the lamb was cut into small pieces and mixed with the sauce which was so hot that neither the children nor myself could catch anything. The fastest teenagers caught the pieces of meat first. As a last resort, I decided to behave like the men in the family. So I strolled to the market and I bought meat kebab that I ate walking along. I brought back peanuts, spices and pieces of lamb to please the women but without expecting anything to eat anymore. Of course small children were not lucky enough to be able to do the same!

This anecdote shows different ways to access to food, not only through family cooking, but also through other networks of exchange from which children are often excluded. Besides, several anthropologists have been interested in exchange networks of cooked food between women of the same district.

At the point of my purpose, we have seen the dangers of a mere culturalistic approach, which provides some medical staff with the idea that women are ignorant.

We have also seen that an exclusive medical culture approach doesn't account for the social conditions of life and leads to a lot of misunderstanding between medical staff and populations.

So, in terms of recommendations we can advise the medical staff to take into account the fact that they must contextualize their development models.

Finally, we can also point out the necessity not to disqualify mothers in their educational function. We know that women are not able to support their isolation, their numerous pregnancies, and all of the other difficulties they are confronted with. Their psychological state must also be considered.

THE WHO GLOBAL DATABASE ON CHILD GROWTH AND MALNUTRITION: METHODOLOGY AND APPLICATIONS

Mercedes de Onis¹, Monika Blössner¹

Introduction

Impaired child growth — indicated by poor anthropometric status — is internationally recognized as an important public health indicator for monitoring nutritional status and health in populations. Children who suffer from growth retardation as a result of poor diets and/or recurrent infections tend to have more frequent episodes of severe diarrhoea and are more susceptible to several infectious diseases, such as malaria, meningitis or pneumonia (1-3). A number of studies have demonstrated the association between increasing severity of anthropometric deficits and mortality, and the substantial contribution to child mortality of all degrees of malnutrition is now widely accepted (4). In addition, there is strong evidence that impaired growth is associated with delayed mental development, poor school performance, and reduced intellectual capacity (5-7).

The internationally recommended way to assess malnutrition at population level is to take body or anthropometric measurements (e.g., weight and height). Based on combinations of these body measurements anthropometric indices are constructed. These indices are essential for the interpretation of body measurements as the weight alone has, for example, no meaning unless it is related to an individual's age or height (8). In children the three most commonly used anthropometric indices are weight-for-height, height-for-age and weight-for-age. These indices can be expressed in terms of z-scores, percentiles, or percent of median, which enable comparison of a child or a group of children with a reference population.

For many years the WHO Department of Nutrition has been using anthropometric data to monitor trends in child malnutrition. A major difficulty has been the lack of comparability of survey results. Although numerous nutritional surveys have been conducted since the 1970s, many of them have used distinct

¹ Department of Nutrition for Health and Development, World Health Organisation, Geneva, Switzerland

definitions of malnutrition (i.e., different anthropometric indices, reporting systems, cut-off points and reference values) thus making comparison of results between studies difficult. This lack of comparable data prompted the beginning of WHO's systematic collection and standardization of information on the nutritional status of the world's under-five population. The WHO Global Database on Child Growth and Malnutrition (henceforth referred to as the "database") was initiated in 1986 to compile, standardize, and disseminate results of nutritional surveys performed worldwide. The specific objectives of this database are to characterize nutritional status; enable international comparisons of nutritional data; identify populations in need; help evaluate nutritional and health interventions; monitor secular trends in child growth; and raise political awareness of nutritional problems. A distinct feature of the database is the systematic analysis of raw data sets in a standard format to produce comparable results. This paper describes the methodology applied in the database and provides examples of how the compiled information is used for promoting healthy growth and development of children.

Methodology

Data sources

Nutritional surveys for inclusion in the database are identified primarily by the following mechanisms:

- An automated literature search in MEDLINE provides weekly updates of bibliographic references according to an established search history. Selected abstracts are reviewed and full articles of relevant surveys obtained from the WHO library;
- A wide network of national and international collaborators provides information directly to the database managers. These include WHO Regional Offices, UN-sister organizations (e.g., FAO, UNICEF, World Bank), non-governmental organizations (e.g., Macro International, Helen Keller International), Ministries of Health and other national institutions (e.g., National Institutes of Nutrition and Statistics), as well as research and academic institutions;
- Principal investigators of nutritional surveys send the data to the database managers;
- Other WHO database managers share information on newly available survey data.

Criteria for inclusion and data quality control

The main criteria for including surveys in the database are:

- A defined population-based sampling frame, allowing inferences to be drawn on an entire population;
- A probabilistic sampling procedure involving at least 400 children;
- Use of standard anthropometric measurement techniques;
- Presentation of results in z-scores in relation to the NCHS/WHO international reference or availability of the raw data, permitting a standardized analysis.

Before inclusion the sampling method applied in each survey is carefully reviewed to ensure population-based representativeness on the administrative level that applies (e.g., national, regional, province, district, local). The majority of national surveys use multistage random sampling methods with only a few countries such as Argentina, Chile, Croatia, Uruguay and Venezuela basing their estimates on national nutritional surveillance systems with high population coverage. Surveys generally follow standard measurement techniques, such as measuring supine length up to 24 months of age and standing height from 24 months onwards (8). Detailed information on the procedures and sampling method used in each survey is given in the comprehensive survey reports that are archived in the database's documentation centre and is made available to users on request.

As part of routine data quality control, survey results are checked for inconsistencies between the estimates based on heightfor-age, weight-for-age and weight-for-height. The observed standard deviations (SDs) of the z-score distribution are used to assess the quality of the survey data. With accurate age estimates and anthropometric measurements, the SDs of the observed heightfor-age, weight-for-age and weight-for-height z-score distributions should be relatively constant and close to the expected value of 1.0 for the reference distribution (ranging within approximately 0.2 units). This nearly constant SD in height- and weight-based z-score distributions provides an opportunity to assess data quality (8). Surveys with an SD outside the expected ranges require closer examination because of possible problems related to age assessment and/or anthropometric measurements. Surveys with obvious inaccurate data resulting from measurement error or incorrect age reporting are generally excluded.

Database workflow

Figure 1: Database workflow



Figure 1 describes the workflow of the database. Once a potentially relevant survey is identified and the documentation obtained, the methods are reviewed as described above. If the survey qualifies for inclusion, the available information is extracted from the documents and filled into the standard data-entry form. Frequently there are methodological queries and/or inconsistencies, as well as additional results that are needed in order to complete the data-entry form. To clarify the queries and obtain the additional results the principal investigators and/or data holders are contacted and a collaboration is established. In many occasions further analysis of the raw data is required. Consequently the analysis is conducted either by the data holders (with technical assistance from the database managers if necessary) or else the raw data set is provided to WHO for standard analysis. Software named ANTHRO, which can be download from the database's web site at http://www.who.int/nutgrowthdb, was developed to facilitate the standard analysis following the databases' format. Once the dataentry form is completed, final consistency checks across indicators take place and the results entered into the computerized system. The full documentation and correspondence with the data holders, as well as any electronic copies of raw data and analysis files are archived in the database's documentation centre.

Data standardization

A distinct feature of the database is the collection of information in a standard format consisting of:

- Prevalences of underweight (low weight-for-age), stunting (low height-for-age), wasting (low weight-for-height) and overweight (high weight-for-height).
- Use of the NCHS/WHO international reference population to derive estimates.
- Use of z-scores cut-off points (i.e., standard deviation (SD) scores): <-2SD, <-3SD and >+2 SD.
- Calculation of summary statistics: means and standard deviations of *z*-scores.
- Stratification of the results by age group, sex, region, urban/rural.

Detailed information on the use and interpretation of the anthropometric indicators, cut-off points, and summary statistics included in the database has been published elsewhere (8,9) and is also available online at the database's web site.

Current developments with regards to the reference data deserve special mentioning here. Anthropometric values are compared across individuals or populations in relation to a set of reference values and the choice of the reference population has a significant impact on the proportion of children identified as being under- and over-nourished. Since the late 1970s WHO has been recommending the National Centre for Health Statistics (NCHS) growth reference, the so-called NCHS/WHO international reference population, for the comparison and presentation of child growth data. A detailed account of the history of the NCHS/WHO reference and general issues that need to be considered when using international reference data are discussed elsewhere (10, 11). In the mid-1990s the NCHS/WHO international reference was found to have important technical and biological drawbacks (8,12). Consequently, an international effort co-ordinated by WHO is presently developing a new international growth reference for infants and young children (13). This new international reference, constructed from primary data collected for this purpose, includes a number of features, which will result in a reference population substantially different from the existing ones. An important characteristic is that it will be based on a truly international

sample. Six countries, representing the major global geographic regions, are participating in this effort. Another notable feature is that it takes the breast-fed infant as the biological "norm", recognizing the health and nutritional benefits of breast-feeding (14). The extent to which the new curves — expected to be available in 2005 — differ from the current ones in shape and the spread of values around the mean will affect the estimates of under- and over-nutrition that have been established using the NCHS/WHO international reference.

Data analysis

The analyses related to the database consist of two separate steps. The first step is the primary data analysis of raw data sets to produce standardized results as described above. To date, more than 400 national and sub-national nutritional surveys have been analyzed to produce standardized prevalences of underweight, wasting, stunting and overweight. The primary analysis of raw data is essential because many nutritional surveys use distinct definitions of malnutrition making comparison across surveys impossible. This was also an important barrier to pooling individual survey data for deriving regional and global estimates. The primary analysis of raw data represents a major and time consuming undertaking. It implies gaining access to the raw data and description of codes and, then, conducting the analysis of large and complex data files. After making the survey results comparable, on a second step, nationally representative survey data are pooled to derive regional and global estimates of under- and over-nutrition in under-fives. Specific statistical analyses used for this purpose (e.g., multilevel modelling) are described in the relevant publications (9,15-17).

Results

As of November 2001 the database included a total of 801 nutrition surveys carried out from 1960 onwards: 370 national surveys from 133 countries and 431 sub-national surveys from 152 countries. A total of 2274 bibliographic citations are included in the reference system. The population coverage of national nutrition surveys is 99% and 64% of children under-five years of age in developing and developed countries, respectively.

The wealth of information compiled in the database has made it possible to conduct in-depth analyses of the levels, trends, and geographical distribution of childhood malnutrition worldwide. Initial results from the database where published in 1993 (15) and updated in 1997 (9). The latter publication also presented for the first time estimates of trends in child growth retardation in developing countries. A more recent analysis updated these earlier estimates and described trends in childhood malnutrition from 1980-2005 (16). The distribution of stunting in developing countries according to the latest prevalence data, are categorized as low, medium, high and very high (<20%, 20-29%, 30-39% and \geq 40%, respectively) (9). The rates of stunting in many countries of sub-Saharan Africa, South-central Asia and South-eastern Asia remain very high. In Latin America and the Caribbean the majority of countries have low or moderate rates. Country-specific prevalence rates disaggregated by sex, age group, area of residence, and administrative region can be found on the database's web site.

The large number of countries with at least two data points (Table 1) enabled to forecast trends in childhood stunting. For this purpose multilevel modelling was applied to the prevalence of stunting allowing for variation in time, country and region (18). Figures 2 and 3 show trends in stunting from 1980 to 2020 in prevalence and numbers, respectively. Estimated trends indicate that overall stunting rates in developing countries will continue to decrease from 29.8% in 2000 to 16.3% in 2020. Progress will however be uneven in different regions. In Africa a minor improvement in the prevalence from 34.9% to 31.1% is predicted for the next 20 years, translating, however, into increasing numbers of affected children (from 44 million in 2000 to 48 million in 2020) due to population growth. In Asia, Latin America and the Caribbean, both the prevalence and numbers of stunted children are expected to continue to decrease further during the same time period.

Regions and sub- regions	Number of countries/total	Number of data points	Number of countries with at least 2 data points
Africa	49 / 53	114	32
Asia ^a Latin America and the Caribbean	34 / 46	80	22
	25 / 33	84	19
Oceania ^b	6 / 15	8	1
All developing countries	115 / 147	286	74

Table 1: Numbers of countries and data points for stunting by
UN regions used in the study

^aExcluding Japan

^bExcluding Australia and New Zealand



Figure 2: Trends in % stunting (1980-2020) by UN regions with 95% confidence intervals (box-whisker plots are at 5-year intervals)

Figure 3: Trends in numbers of stunted children (1980-2020) by UN regions with 95% confidence intervals (bar plots are at 5-year intervals)



Overweight, reflecting the other extreme of malnutrition in children, has become a matter of growing concern. In developed countries several studies have shown increasing rates of overweight in children, whereas, in developing countries the extent of the problem was unknown given that surveys had not been analyzed to report this information. The standard analysis of raw data sets for the database has allowed to fill this gap by quantifying patterns and trends of overweight among pre-school children in developing countries (17).



Figure 4: National overweight and wasting prevalence

52

Figure 4 shows the latest data on prevalence of overweight and wasting in children aged <5 years in 102 countries listed by wasting rates in descending order (19). Prevalences of overweight and wasted children are presented together to enable comparisons between both ends of the distribution. Countries with the highest prevalences of overweight are located mainly in the Middle East, North Africa, and Latin America. Rates of wasting were generally higher than those of overweight and Africa and Asia had wasting rates 2.5-3.5 times higher than rates of overweight. The results of this analysis show that attention should be paid to monitoring levels and trends of overweight in children. However, this should not be done at the expense of decreasing international commitments to alleviating undernutrition (17).

Another recent use of the information collected by the database has been the assessment of the timing of growth faltering worldwide and its implications for interventions for preventing child malnutrition (20). An analysis of 39 nationally representative data sets from recent surveys in developing countries showed that the mean z-scores of length/height-for-age at birth are very similar in Africa, Asia and Latin America, and close to the NCHS growth reference. In all 3 regions, however, the mean z-score falls sharply from birth to about 24 months and continues to fall well into the third year, albeit at a slower rate (Figure 5). The magnitude of the drop in Latin America and the Caribbean is about 1.25 SD, whereas in Africa and Asia the drop is of approximately 2 SD (20). An important finding of this analysis is the remarkable similarity of the patterns of growth faltering in developing countries, not only within a region but also globally, despite the different instruments and measuring techniques used in the various surveys. These results show that interventions during the earliest periods of life are likely to have the greatest impact in preventing child malnutrition. Special emphasis should thus be given to the development of effective interventions to stop the critical faltering that occurs from birth to 24 months.



Figure 5: Timing of growth faltering in length-for-age by region

Source: Shrimpton et al. Pediatrics 2001;107(5).

In May 1999 the database was made accessible on the Internet at the web address http://www.who.int/nutgrowthdb. The database's web site — updated bimonthly — enables its users anywhere in the world to obtain at any time the latest information from the database. Following the launch of this web site the number of the database users has been continuously increasing. To this point in time, the database's web site has more than 5600 registrations and there are many direct links to it. In addition to the numerous individual users, the United Nations (UN) organizations such as the ACC/SCN, FAO, UNICEF, the UN Population Division of the Department of Economics and Social Affairs, and the World Bank use regularly the information included in this database for their routine reporting on child nutritional status and its association with other health and socio-economic indicators (21-27). Similarly, many national and international institutions and nongovernmental organizations use the database as the data source for information on child malnutrition (28,29).

Conclusions

The 15 years experience of the database can be regarded as a success story of international collaboration in standardizing child growth data. This success can be measured by the wide acceptance of the database's principles, the range of uses being made of the data, and the steadily growing network of collaborators. The database relies heavily on this network which has been developing a dynamic of its own leading to the early involvement of the database managers in large-scale surveys. This reflects the high interest of collaborators in supporting WHO in this global effort of monitoring child growth and malnutrition. The experience of the WHO Global Database on Child Growth and Malnutrition could be a model to follow for monitoring other nutritional disorders and/or health conditions that lack comparable data.

While continuing its routine, the database faces a number of challenges. First, the release and implementation of the new international growth reference in 2005 will have important implications for the management of the database. Second, trends in nutritional status for countries undergoing nutritional transition indicate the need to pay close attention to the monitoring of overweight and obesity during childhood (17). Users of populationbased estimates should shift in their concentration on the traditional indicator of weight-for-age to focus more on length/height-for-age as well as weight-for-length/height. This would allow identifying stunted children of low weight-for-age but normal weight-for-length/height, to whom excess energy should not be given since this could lead to obesity (30). Third, the association between prenatal and postnatal growth and the magnitude of the problem of intrauterine growth retardation (IUGR) in developing countries (31) calls for the need to incorporate into the database the monitoring of impaired foetal growth. A potential methodology that will allow overcoming current constraints to derive populationbased estimates of IUGR is currently being developed. Monitoring the patterns and trends of IUGR is expected to trigger public health action in populations where interventions aimed at preventing foetal growth retardation are urgently needed. Lastly, the availability of reference data for motor development milestones being developed as part of the new international growth reference (14) will provide the possibility to monitor motor development, establishing an important link between physical growth and development in children.

The future of human societies relies on children being able to achieve their optimal physical growth and development. The database serves to increase awareness of the magnitude of the problem of child malnutrition worldwide and to alert decisionmakers of how much remains to be done in order to ensure children's healthy growth and development.

Acknowledgements

We are grateful for the statistical support by Dr Allen Shoemaker in conducting primary data analysis of raw data sets and Drs Edward Frongillo and Richard Morris in deriving the model estimates of the regional and global trends.

References

- 1. Tomkins A, Watson F. Malnutrition and infection: a review. ACC/SCN State-ofthe-art Series, Nutrition Policy Discussion Paper No. 5. *Geneva: United Nations Administrative Committee on Co-ordination/Subcommittee on Nutrition*, 1989.
- 2. Man WD, Weber M, Palmer A, Schneider G, Wadda R, Jaffar S et al. Nutritional status of children admitted to hospital with different diseases and its relationship to outcome in The Gambia, West Africa. *Trop Med Intl Health.* 1998;**3**:678-686.
- Victora CG, Fuchs SC, Flores JA, Fonseca W, Kirkwood B. Risk factors for pneumonia in a Brazilian metropolitan area. *Paediatrics*. 1994;**93**(6 Pt 1):977-85.
- 4. Pelletier D, Frongillo EA Jr, Habicht JP. Epidemiologic evidence for a potentiating effect of malnutrition on child mortality. *Am J Public Health.* 1993;**83**:1130-3.
- 5. Mendez MA, Adair LS. Severity and timing of stunting in the first two years of life affect performance on cognitive tests in late childhood. *J Nutr.* 1999; **129**:1555-62.
- 6. WHO. A critical link. Interventions for physical growth and psychological development. A review. Doc WHO/CHS/CAH/99.3. *Geneva: World Health Organization*, 1999.
- 7. de Onis M. Child growth and development. In Semba RD, Bloem MW (Eds.): "Nutrition and Health in Developing Countries". *Totowa, NJ: Humana Press*, 2001;71-91.
- 8. WHO. Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. Technical Report Series No. 854. *Geneva: World Health Organization*, 1995.
- 9. de Onis M, Blössner M. WHO Global Database on Child Growth and Malnutrition. *Geneva: World Health Organization*, 1997.
- 10. de Onis M, Yip R. The WHO growth chart: historical considerations and current scientific issues. *Bibl Nutr Dieta*. 1996;**53**:74-89.
- 11. de Onis M, Habicht JP. Anthropometric reference data for international use: recommendations from a World Health Organization Expert Committee. *Am J Clin Nutr.* 1996;**64**:650-8.
- 12. WHO Working Group on Infant Growth. An evaluation of infant growth: the use and interpretation of anthropometry in infants. *Bull WHO*. 1995;**73**:165-74.
- 13. de Onis M, Garza C, Habicht JP. Time for a new growth reference. *Paediatrics*. 1997;**100**(5).
- 14. de Onis M, Victora CG, Garza C, Frongillo EA Jr, Cole TJ for the WHO Working Group on the Growth Reference Protocol. A new international growth reference for young children. In: Dasgupta P, Hauspie R (Eds.). Perspectives in Human Growth, Development and Maturation. *Dordrecht, The Netherlands: Kluwer Academic Publishers*, 2001;45-53.

- de Onis M, Monteiro C, Akré J, Clugston G. The worldwide magnitude of protein-energy malnutrition: an overview from the WHO Global Database on Child Growth. *Bull WHO*. 1993;**71**:703-12.
- de Onis M, Frongillo EA Jr, Blössner M. Is malnutrition declining? An analysis of changes in levels of child malnutrition since 1980. *Bull WHO*. 2000;**78**:1222-33.
- de Onis M, Blössner M. Prevalence and trends of overweight among pre-school children in developing countries. Am J Clin Nutr. 2000;72:1032-9.
- Blössner M, de Onis M, Morris R. Forecast of trends in child malnutrition (3.09.108). Ann Nutr Metabol. 2001;45(Suppl 1):298.
- 19. de Onis M and Blössner M. Global prevalence and trends of overweight among pre-school children (W.11.104). Ann Nutr Metabol. 2001;**45**(Suppl. 1):580.
- Shrimpton R, Victora CG, de Onis M, Costa Lima R, Blössner M, Clugston G. Worldwide timing of growth faltering: implications for nutritional interventions. *Paediatrics*. 2001;**107**(5).
- UN Administrative Committee on Co-ordination /Subcommittee on Nutrition (ACC/SCN). Third Report on the World Nutrition Situation. Geneva: ACC/SCN, 1997.
- 22. UN Administrative Committee on Co-ordination /Subcommittee on Nutrition (ACC/SCN) and International Food Policy Research Institute. Fourth Report on the World Nutrition Situation. *Geneva: ACC/SCN*, 2000.
- 23. UNICEF. The state of the world's children 1998: Focus on nutrition. *New York: Oxford University Press*, 1998.
- 24. FAO. The Sixth World Food Survey. Rome: Food and Agriculture Organization of the United Nations, 1996.
- 25. FAO. The State of Food Insecurity in the World. Rome: Food and Agriculture Organization of the United Nations, 2001.
- 26. United Nations Secretariat. Department of Economics and Social Affairs Population Division. Charting the progress of populations. ESA/P/WP.149. *New York: United Nations*, 1998.
- 27. WHO. Health Intelligence Network for Advanced Planning (HINAP), v.1.5. Baseline indicators by country V. Nutrition (http://www.who.int/disasters/).
- 28. Smith LC and Haddad L: Explaining child malnutrition in developing countries: a cross-country analysis. IFPRI Research report 111. *Washington: International Food Policy Research Institute*, 2000.
- 29. Bread for the World Institute. Hunger in a global economy: Hunger 1998. Eighth annual report on the state of world hunger. *Silver Spring, Maryland: Bread for the World Institute*, 1997.
- 30. Uauy R, Kain J. The epidemiologic transition: need to incorporate obesity prevention into nutrition programmes. *Public Health Nutr.* 2002. (In press)
- de Onis M, Blössner M, Villar J. Levels and patterns of intrauterine growth retardation in developing countries. *Eur J Clin Nutr.* 1998;52:S1, S5-S15.

HEALTH PROFESSIONALS' PERCEPTIONS OF GROWTH MONITORING AND PROMOTION PROGRAMMES IN SELECTED DEVELOPING COUNTRIES

Dominique Roberfroid¹, Pierre Lefèvre¹, Patrick Kolsteren¹, Tom Hoerée¹

Introduction

The WHO defined Growth Monitoring and Promotion (GMP) as a nutrition intervention that not only measures and charts weight of children, but also uses information on physical growth to counsel parents in order to motivate actions that improve growth (1). From this perspective, the growth chart was proposed as an educational tool to make the child growth visible to both health workers and mothers (2). In case of adequate growth, parents could be encouraged and be given advice on how to preserve the good growth of their child. In case of growth faltering, the condition could be detected and made apparent long before any easily observable signs or symptoms of malnutrition become evident. This would trigger a reaction of health workers and caretakers in order to institute timely corrective measures and put the child back on an upward growth trajectory (3-6). To put it in a different way, parents are expected to appropriate the chart as a tool to evaluate and understand the growth and development of their children.

As malnutrition is an important factor associated to the high under-five mortality rates observed in developing countries (7,8), great hopes have been put in GMP programmes to achieve the goals of the Child Survival and Development Revolution (2,9). However, several authors have pointed out that despite important international efforts, there is little evidence of achieving these goals (10). Explanations for this failure have been sought in the poor performance of the growth chart as a measurement tool, the insufficient or inadequate training and supervision of basic health workers (11) and the poor understanding by parents, particularly those with low school achievement (12-15).

In the whole debate on growth monitoring, the way mothers understand and use the growth chart has received much attention.

¹ Nutrition and Child Health Unit, Institute of Tropical Medicine, Antwerp, Belgium

How health managers, such as District Medical Officers who organize the health system and the activities, view and appreciate growth monitoring has, to our knowledge, never been addressed. This is quite surprising when one considers that they bear the responsibility for implementing GMP at the local level and as such constitute the main articulation between international health policies and national/regional contexts of application. The aim of this qualitative research was therefore to explore the perceptions of these professionals regarding GMP and understand their difficulties and expectations.

Methods

Between October and December 2000, 18 district medical officers from South America, Europe, Africa and Asia were interviewed by an anthropologist with a medical background. They were randomly selected from a class beginning a public health master programme in Antwerp, Belgium. All of the interviewees were or had an experience as District Medical Officer.

Table 1: Characteristics of participants

	Age	Sex	Country	Function	
1	34	Μ	Burkina Faso	District Medical Officer	
2	30	Μ	Bolivia	Head of Health Centre	
3	39	Μ	Morocco	Head of Hospital	
4	42	Μ	Conakry Guinea	Prefecture Medical Officer	
5	36	Μ	Chad	District Medical Officer	
6	35	Μ	Zambia*	Medical Officer	
7	36	F	Niger	Regional Medical Officer	
8	38	Μ	Morocco	Head of Medicine Service in hospital	
9	38	Μ	Ivory Coast	District Medical Officer	
10	37	Μ	Haiti	Head of Planning Service, Ministry of	
				Health	
11	36	F	Rwanda	Medical Officer	
12	36	Μ	Congo DRC	District Medical Officer	
13	42	Μ	Togo	Prefecture Medical Officer	
14	30	Μ	Cuba	Director of Health Services	
15	46	Μ	Chad**	Paediatrician	
16	42	F	Philippines	Chief Executive Officer, Health District	
			• •	Management Team	
17	43	Μ	Bangladesh	Head of Field Service Unit of sub-district	
18	29	Μ	Zimbabwe	Medical Officer	
19	32	Μ	Kenya	Paediatrician, Research Officer	

Nationality: *=Belgian, **=Italian.

Other participants were working in their own country

The in-depth interviews were conducted in French and English and lasted 45 minutes to 75 minutes. A series of structured prompting questions was used (see Table 2). All interviews were tape-recorded with the respondent's permission and fully transcribed. Transcription was done by a secretary and was checked against the recordings by the reviewer to ensure accuracy. Data were coded using QSR Nudist 5.0 software (QSR International Pty. Ltd., Melbourne, Australia. 2000) to facilitate cross-indexing. Coding in thematic blocks was made on the basis of the prompting questions, but also iteratively for themes emerging during the close examination of the transcripts. Analysis of data was performed by the interviewer and cross-checked by a sociologist to ensure reliability (16,17). The transcripts of the interviews were analyzed for the discourses that participants drew on to articulate their understandings and experiences of GMP. It is accepted in such research that the discourses articulated by the participants emerge from a pre-established stock of discourses already circulating in a culture, i.e. the field of international health in this case. The use of discourse is highly socially contextual. The data were thus considered as social constructs, i.e. as displays of perceptions, belief systems or assumptions, not as presentation of versions of "reality".

Table 2: List of the prompting questions used during the interviews

- Did/do you use the growth chart in your work? In which circumstances? What do you think of it? What were/are your expectations/objectives in using such tool? Were they satisfied?
- 2 In your experience, do you consider that the GMP programme was well done? On what criteria do you base your evaluation? How would you define a good GMP programme?
- 3 If the UNICEF proposes, for whatever reason, to stop using the growth chart, how this recommendation would modify programmes aimed at improving health and growth of children in your country?
- 4 Do you consider that GMP contributes to improve child health? If yes, by which mechanisms? If no, what are, according to you, the problems, the impediments, the conditions that should be met?
- 5 Did/do the parents use the growth chart? Do they find it useful? How do they measure the growth and development of their children? Do they use other criteria then the weight and the height to do so? How did/do you proceed with your own child (children)? 6 You said that a copy of the growth chart was given to the mother. What was the
- rationale for doing so? Was it realized?
- What conclusions would you like to draw following our discussion?

Results

The interviews collected a large variety of experiences and opinions, reflecting the international pattern of the panel. Interviewees were coming from settings where nutritional issues, malnutrition rate, literacy rate, health policy, organization and resources of health services differed a lot (see table 1). Interviewees themselves had a very different personal and professional history, although all were medical doctors and had served as District Medical Officer.

Despite this variety of backgrounds, the interviews were quite homogeneous in the appreciation of the effectiveness of growth monitoring. The majority of the interviewees expressed the opinion that, in their experience, GMP did not work the way it ought to.

"In theory, we have to follow-up a lot of parameters. In reality, it is mainly focused on vaccination activities..." (12, 42-44)

"I would say it is quite a difficult activity because we have a lot of difficulty to carry it out [...]. In the context of Chad, I think, yes, that this is nearly utopian" (5, 291-293)

"Of course, we did it [GMP]. There are many things done only by routine. It was there, so we kept it on, maybe due to the lack of time to find a new strategy" (6,140-141)

"In theory, it is a good tool, it is very interesting, but in practice, it is different. It is maybe more a tool for me than for the mother. To do evaluations, statistics" (15,168-170)

This discrepancy between theory and practice of GMP was indeed identified at two levels in the discourse of the participants, first in the narrative of personal experiences, second in the expression of understandings and perceptions of GMP.

Narrative of personal experiences

Interviewees evoked operational difficulties in the implementation of GMP. The most consistently reported reason was irregular attendance of mothers at weighing sessions once the vaccination schedule was completed. Participants explained this as a lack of interest of mothers in programmes, which do not display technical acts and visible effects. Mothers were also said to rely on their own criteria to evaluate their child's growth and health, and to refer themselves to health services only in case of obvious child disease (see communications by CedS, pp 87-95, and by Emma, p 80-86).

"Maybe malnutrition is not perceived as an infectious disease. Measles is something striking, is something that people know well. Malnutrition becomes a problem when it is severe. When it is moderate, people do not notice it." (15,183-187)

"Ideally, it is an objective of prevention. But in practice, it is as I told you. For health agents as for beneficiaries, it is rather when there is a problem" (1,622-623)

«Because in general mothers when they think their child is in good health, he runs, he gambols, they do not see the necessity to bring the child only for parameters measurements...»(5, 30-32)

An additional explanation of the poor adherence to the programme put forward was the weakness of awareness campaigns for GMP to motivate parents to adhere to the programme. The responsibility of this was partly attributed to health workers and their low motivation to perform GMP activities. Low competence and the heavy workload of field staff were presented as impediments to GMP², although it was not clear why GMP should have been more particularly affected by these 2 limitations than other health activities.

"It is neglect somehow. But it is also due to the (low) interest of health agents for nutritional problems" (1,353-355)"

"Thus the nurse can have the feeling that her effort is a little bit useless, disproportionate, not always, but sometimes. You have to control, to put some pressure on her but always you have to keep in mind that there are a lot of other tasks, maybe more crucial in the context" (2,150-153)

"Often, the problem is that our health agents can not argue properly with an old mother who has 12 or 15 children. What advice could you give her? You do not advice her because this woman knows better than you how to manage a child. Often people [health workers] are limited because their basic background is not enough..." (7, 187-193)

"When they get too busy, they have a lot of forms to fill in, then do not explain well to the mothers. They also think that it is not that important that mothers understand, because the understanding point is quite low, you see." (16, 58-61)

A second group of limitations of growth monitoring put forward related to the capacity of response of parents to the information provided. First it was said that the parents fail to

² This was particularly mentioned in Sub-Saharan countries where the responsibility of the GMP is beared most of the time by basic health workers.

understand the growth chart, mainly because they are illiterate or not educated.

"...Because in our country, they are illiterate. They do not understand too much what is written on it [the growth chart], it is not too much their concern..." (1,341)

"The literacy rate is not very high. So she [the mother] goes home and she doesn't know" (9,265-266)

" But I am wondering if she [the mother] really understands. Because it is simple, but sometimes nurses also have difficulties to fill in [the growth chart]..." (15, 209-210)

"It is difficult to implement because people are mostly illiterate. There is a lack of enthusiasm, of knowledge; they cannot understand what is good for them, what is bad for them. Illiterate mothers tend to participate less, they are less concerned" (17, 23-26)

Secondly, the lack of response to the messages was related to food insecurity and thus limited applicability of nutrition advice in some contexts.

"You will say 'he is malnourished, you must feed him'. But they know it, they know that the child does not eat very well because it is the same meal every morning, every lunchtime, every evening, there is no milk, it is always bulgur. What are you going to propose? You are not going to propose anything because she won't have the capacity to apply what you will propose (...) This is a problem. Thus I think they are right not to come to be repeated the same thing ten times" (7,515-523)

Understandings and perceptions of GMP

The preceding results demonstrated that the explanations given for the resented malfunction of GMP relate much to operational problems, in particular the demand of the population for technical aspects and not for promotional aspects. Looking at the statements provided by the interviewees, we find the same dialectic in their discourse between technical (visible, curative) and intuitive (invisible, preventive or promotional) aspects of care. Health officers endorse in fact, consciously or implicitly, the importance of the technical aspects in GMP with much less emphasis put on health and growth promotion.

"This (growth) chart was made in the frame of the national vaccination day, thus the objective is the vaccination. In the mind of

people [health workers], the weight and height monitoring is a secondary objective" (3,278-281)

"Yes, I always said that, the mother has not come to learn that her child gained weight or not. She has come for you to do something else. You do the vaccinations" (18, 201-203)

One of the interviewees did this revealing pun:

"A malnourished one is not going to contaminate somebody else. He does not carry much weight in the society" (9,389)

Strikingly, the criteria used by mother to evaluate their child's growth, as mentioned above, were grossly unknown by the interviewees but nonetheless qualified as subjective, approximate, and intuitive by them.

«The child has no disease, no diarrhoea, no whooping cough, he walks, and he laughs. That is all. It is a subjective assessment" (13,329-331)

«... But besides this, there is no other means to evaluate, except the physical aspect. Because the majority of mothers, nearly all of them, in the countryside, do not have weighing scale at home, it is just the physical aspect" (10,301-303)

"Thus I think that mother's perception is a criterion that can not be really defined, but I believe it is important even if it is intuitive"(5,176-177)

"I think these are good criteria because mothers at home need to know and they are not technicians, and the Z-scores are not their concern at all. But for the technician, I think that more technical criteria are required" (9,277-282)

"Their criteria give an idea but this is not something that is very acute (...). We are giving GMP criteria in a scientific way, they [the parents] are not up to that point, they have a very general idea" (17, 356-357)

Thus mothers are said to come for vaccinations because this is part of the technical sphere that is under the responsibility of the health services. They do not come for growth monitoring because this is part of the field of social communication, which is outside the acknowledged and claimed responsibility of health agents. Strikingly, some of the interviewees even tended to consider communication as a "no-act", while weighing was considered as the technical justification of their presence in GMP. As summarized by one interviewee: "Finally, to weigh, as I said previously, demonstrates to the mother that an act is done [...]. Secondly, it is also an act, not a medical one, but an act made by the health agents that can encourage the mother to come back the next time. Because if she comes to sit down and listen the advice, it is not so clear that she will come because, in the village spirit, she will think it is not so useful to go only for advice. That is what I think" (5,132-147)

"Her task [the village volunteer] is much more to gather the mothers and to be willing to listen to them but she does not act" (5,344-45)

From this perspective, communication with parents on the basis of the growth curve is secondary. It was never reported as a means or a result of GMP, nor as a criterion to evaluate the programme during supervision sessions. The growth chart was mainly considered as a tool intended to be used by health services for diagnostic purposes and for the health information system. The following example can serve as a good illustration of it. In every country, the growth chart, or a copy of it, is given to the parents. But the rationale for doing so, as expressed by the interviewees, was preservation and transfer of information, in particular information on vaccinations and diseases. Never were cited, for instance, appropriation of the tool by the caretakers or their commitment in monitoring their child's growth. The fact that caretakers did not understand the content of the chart (and thus were unable to recall the clinical history of their child) was even presented by some interviewees as the precise reason to give it to them, in order to bring it with them at every consultation.

"I find it useful to not lose information. But if there were another means, better to get the information, I think we can let it [the health card] down" (12, 225-227)

« The objective is not to discuss with parents to educate them but the objective is to determine if the child is malnourished or not. I think that with that objective, we do not have to discuss with the mother to know if the child gained weight or not" (9,295-297)

Once the diagnosis is made, the focus is on education, recommendations, vertical transmission of information and advice, rather than on communication with the caretakers. Rarely conditions are met for a balanced and specific exchange of information regarding one particular child's health.

"We measured weight, we look if he [the child] is inside [the growth path] or he is not. If he is not, we advise the mother to do that

or that. The objective is not to improve the relationship with the users" (9,302-304)

"During preschool consultations for instance, they used to measure the weight, to report it, and then to give ex-cathedra a health education session for everybody. And standard advice was given on how to prepare meals, child spacing,..." (6,79-81)

"We developed a strategy: when the weight is becoming stationery, these mothers have to stay after the consultation for nutritional advice" (12,152-153)

"Advice is always given. There is more or less standardized advice. This depends on the experience and competence of health agents to adapt it to the context, to every single mother. But advice is always given" (2,170-173)

One interviewee, mentioning a quite satisfactory ability of his staff to interact with caretakers, perceived the unbalance in the communication process:

"This is my feeling, my understanding: health agents, nurses, doctors can speak well but often can not listen. Maybe that messages and advice will work much better if one can develop the capacity to listen. It is only an idea. It is easy to talk" (2,207-212)

"Our function as parents is to give our views on our conception of malnutrition. I think there are a lot of presupposed things, that maybe are true for us, but maybe are not" (2,448-449)

As mentioned above, the dichotomy was conscious for some of the interviewees. They explained it as the result of their professional training with its focus on curative approach, but also by the fact that the health system itself tended subsequently to give more value to technical acts.

"I think that it depends on the training, I would not say on the ideology, but on the way to see things as we were trained to. Yes, you are health agents; yes you are here to fight against diseases, to heal people. It is how it is said during your training or even on several occasions..." (1,641-645)

"We are not trained on the determinants of nutritional issues, that is to say to evaluate problems in their globality" (1,359-360)

"It is necessary to vaccine, to reach a high coverage. Much more weight is given to that. For instance, if you speak of the minimum package of activities at the level of the Public Health Ministry, they look much more at the immunization coverage than at the management of malnourished children. It is much more interesting..." (5,195-198)
"Communication with parents is more or less good, but we have to keep them pressurized [the health workers] to make their performances. Are they interested? They are more concerned by immunization because each single case is checked by us, and this is transmitted at the district level. Much emphasis is given nationally on immunization." (17, 258-62)

Finally, the gap between theory and practice, between what should be done and what is actually implemented, resulted for some medical officers in a feeling that GMP was a frustrating but compulsory routine because prescribed by national and international recommendations. Others got over the contradiction by considering that the programme had still a role to play because there was either no relevant alternative for it or because the growth chart was useful to health services.

"First, this is an activity of the Ministry of Health, thus we can not forget it because of the risk of being reprimanded (...). It is the WHO, the UNICEF who advised to do so. It is the WHO who said we have to do that. If not, certain things are not funded, so we do it" (13,363-371)

"Because the doctor feels very nice, very comfortable with the Mother-and-Child programme. It is a priority programme of the Ministry of Health" (14,51-52)

"I would say that most of the time we do it because we were told to do so, the WHO told us that it was useful, important, it was interesting, but I think that in every-day practice, with some experience, you can manage without the growth chart" (15,66-69)

"It won't change anything if we stop the programme. All the more that the coverage rate is not high. Thus with or without the chart, we work the same way. [Hesitation]. But even so, it is a tool for the management of activities that we can maintain" (19,154-157).

"I do not believe that used as it is it will make great changes. On the other hand, could it be useful in a more global approach? I still have to think about it. But it is even so useful; there is something visual in it. And as a tool, there is always an explanation phase, it could be useful indeed" (6, 115-120)

"And before abolishing, you need something to replace it, a valid alternative, and we do not have it. We have no time for it and I think that there would be some resistance from the staff to not use it anymore" (16, 143-146)

Discussion

This study was exposed to two potential limitations. The first one concerns the external validity of the results. The DMO's interviewed constituted a particular group with at least the specificity of beginning a master in public health in a European country. They were not necessarily a representative sample of DMO's active in the field. The second one concerns a possible information bias. The content of the interviews could have been influenced by the fact that the study took place in the institute where the interviewees were studying and was led by an anthropologist employed by the same institute (18). The Master course is also focused on health care management and not on disease control. It has large emphasis on participatory processes and the provision of health care in a process of communication with the population. Some type of answers could therefore have been considered more appropriate or acceptable to provide to a staff member. If these two limitations were real, they do not contradict or invalidate our analysis however. On the contrary, we would have expected more answers mentioning health service activities committed to communication and transfer of decision-making powers.

Health professionals interviewed in this study reported a twofold discrepancy between the planned activities and actual practice of GMP.

The first level of discrepancy was linked to operational difficulties in implementing GMP in various contexts. The findings of this study are consistent with those of previous studies. The drop in compliance after the immunization schedule is complete was often mentioned and raised questions about the real acceptability of GMP by the caretakers (19). On how caretakers understand the chart, the reviewed studies reported mitigating results. But overall scores are low (12, 20-24). The association with literacy, however, is quite consistently reported in the studies (12). The understanding of the growth chart and of GMP by health workers, on the other hand, has been much less addressed, although it is potentially a crucial element (25-28). For instance, it was shown in one study that when health workers had a correct knowledge of GMP, a substantially higher proportion of growth charts was maintained (23). One potential explanatory factor for the low comprehension rates reported in mothers, as mentioned by some interviewees, could be due to low comprehension or low communication ability of health workers themselves (19,20,24,25). It has been proposed that nutrition education could be more effective by making it more specific, action-oriented, individualized, and relevant (29-31). But

this will be only if clear algorithms for decision-making are available and if health workers are trained in social communication and nutrition negotiation (29). Unfortunately, these conditions appear to be rarely fulfilled under field conditions (13, 14, 19, 25-27, 32, 33). For instance, a study in Zambia reported little variation between the consultation time of a child who was growing well and one with faltering growth (about 30 seconds in both cases!) (33). In Papua New Guinea, the MCH nurses did not spend any longer if the child was losing weight (27).

The acceptability of growth monitoring by health workers has been poorly investigated. It has often been reported, as did several DMO's in this study, that health workers perform weighing sessions more like a ritual than anything else. A possible explanation of this attitude can be found in a behavioural study in Papua New Guinea. It showed that nutrition education was a task, which MCH nurses did not enjoy and did not see as very important; consequently it was all but eclipsed by examining, weighing and prescribing 27).

The present study revealed also that most of the medical officers interviewed, by understanding or by conviction, did not attach great importance to the communication process theoretically underlying GMP. Two hypotheses can be proposed to explain the poor results of GMP (34). The concept is either irrelevant or wrongly implemented. The findings of our study widened this second hypothesis. If caretakers, in general, understand and use poorly the growth chart, this might be the final result of a gap in understanding between international policy makers and local implementers. Indeed, in the interviews, GMP appeared quite secondary in Primary Health Care, and communication quite secondary in GMP. But it might be as well that the two hypotheses are strongly interrelated: to implement a same concept (monitoring and promoting growth) with a same tool (graphical representation of the growth) in a variety of cultural contexts and nutritional causalities can be considered a priori irrelevant. The question can be raised if this conceptual and technical sort of imperialism is not antinomic to the idea of communication also imbedded in GMP. For instance, the fact that what constitutes adequate growth does not necessarily overlap between lay people and health professionals has been overlooked (35,36). It was shown in Ghana, for instance, that weight variation was only one indicator among many others traditionally used by caretakers to assess the nutritional status of their children (37). In promotion as in evaluation of GMP, the significance of local beliefs and behaviour patterns concerning child growth has seldom been recognized within the context of more "modern" approaches based on Western concepts of health and disease. The important international promotion of the growth chart might not have taken various cultural definitions of adequate growth enough into account so far (38-40). Thus it has been proposed that a way of improving GMP would be to bring together the observations and measurements made by both mothers and health workers (20,31,39). However no GMP programme based on such association of criteria has been reported so far. And unfortunately, according to the results of this study, the process seems far from being under way.

References

- 1. WHO. The growth chart. A tool for use in infant and child health care. *Geneva: World Health Organization*, 1986.
- 2. Nabarro D, Chinnock P. Growth monitoring: inappropriate promotion of an appropriate technology. *Soc Sci Med.* 1988;**26**:941-8.
- 3. Garner P, Panpanich R, Logan S. Is routine growth monitoring effective? A systematic review of trials. *Arch Dis Child.* 2000;**82**:197-201.
- 4. What happened to growth monitoring? [editorial]. Lancet. 1992;**340**:149-50.
- 5. Thaver IH, Husein K, Cara NB. The "P" in GMP--a major shift in growth monitoring programme of a primary health care project. Southeast Asian J Trop Med Public Health. 1993;**24**:23-7.
- 6. Henry FJ, Briend A, Cooper ES. Targeting nutritional interventions: is there a role for growth monitoring? *Health Pol Plann.* 1989;**4**:295-300.
- 7. Schroeder DG, Brown KH. Nutritional status as a predictor of child survival: summarizing the association and quantifying its global impact. *Bull World Health Organ.* 1994;**72**:569-79.
- 8. Pelletier DL. The relationship between child anthropometry and mortality in developing countries: implications for policy, programmes and future research. *J Nutr.* 1994;**124**:2047S-81S.
- 9. Garn SM, LaVelle M. Interaction between maternal size and birth size and subsequent weight gain. *Am J Clin Nutr.* 1984;**40**:1120-1.
- 10. Dixon RA. Monitoring the growth of the world's children. *Ann Trop Paediatr.* 1991;**11**:3-9.
- Gopalan C, Chatterjee M. Use of growth charts for promoting child nutrition. A review of global experience. Special publication 2. Nutrition foundation of India 1989.120 p.
- 12. Grant K, Stone T. Maternal comprehension of a home-based growth chart and its effect on growth. *J Trop Pediatr*. 1986;**32**:255-7.
- Ndao I. Evaluation du fonctionnement du suivi de la croissance dans les centres SMI du Congo. 1-60. Thesis. Université Senghor, Egypte, 1992.
- 14. Gerein N, Ross DA. Is growth monitoring worthwhile? An evaluation of its use in three child health programmes in Zaire. *Soc Sci Med.* 1991;**32**:667-75.
- 15. Anonymous. Growth monitoring--a way to help improve the growth of young children and reduce chronic child malnutrition that deserves more attention in East Africa. *East Afr Med J.* 1987;**64**:793-4.
- 16. Patton MQ. Qualitative evaluation and research methods. *Beverly Hills: Sage publications*, 1990.
- 17. Miles MB, Huberman MA. Qualitative data analysis: an expanded sourcebook. *Thousand Oaks: Sage Publications*, 1994.
- Richards H., Emslie C. The 'doctor' or the 'girl from the University'? Considering the influence of professional roles on qualitative interviewing. *Fam Pract.* 2000;**17**:71-5.

- 19. Mapatano MA, Lusamba D, Banea M. Evaluation of growth monitoring programme in children in Kinshasa. *East Afr Med J.* 1997;**74**:96-9.
- Fagbule DO, Olaosebikan A, Parakoyi DB. Community awareness and utilization of growth chart in a semi-urban Nigerian community. *East Afr Med J*. 1990;67:69-74.
- 21. Aden AS, Brännström I, Mohamud KA, Persson LA, Wall S. The growth chart a road to health chart? Maternal comprehension of the growth chart in two Somali villages. *Paedriatr Perinat Epidemiol.* 1990;**4**:340-50.
- 22. Karim F, Huq N, Brown L, Chowdhury AM. Growth monitoring in the context of a primary health care programme. *Food Nutr Bull*.1994;**15**:192-9.
- 23. Gopaldas T, Christian PS, Abbi RD, Gujral S. Does growth monitoring work as it ought to in countries of low literacy? *J Trop Pediatr.* 1990;**36**:322-7.
- Rasheed P, Sunbul TJ, Ahmed BE, Al Saleh AM. The growth chart its use and perception among mothers visiting primary health care centers of Al Khobar, Saudi Arabia. Saudi.Medical.Journal. 1996;17:195-203.
- 25. Lalitha NV, Standley J. Training workers and supervisors in growth monitoring : looking at ICDS. *Ind J Pediatr.* 1988;**55**:S44-S54.
- 26. Gopaldas T. Field level health worker's skill in detection of growth retardation and faltering in young children. *Ind J Pediatr.* 1988;**55**:S55-S58.
- Reid J. The role of maternal and child health clinics in education and prevention: a case study from Papua New Guinea. Soc Sci Med. 1984;19:291-303.
- Kapil U, Sood AK, Gaur DR, Bhasin S. Assessment of knowledge and skills about growth monitoring amongst multipurpose workers in an ICDS project. *Indian Pediatr.* 1991;28:895-9.
- 29. Griffiths M, Dickin K, Favin M. Promoting the growth of children : What works. Rationale and guidance for programmes. Washington: The Manoff Group, 1996.
- 30. Lofti M. Growth monitoring: A brief literature review of current knowledge. *Food Nutr Bull.* 1997; **10**:3-9.
- 31. Griffiths M. Growth monitoring Making it a tool for education. Ind J Pediatr. 1988;55:S59-S66.
- Behague D. Growth monitoring and the promotion of breastfeeding . Soc Sci Med.1993;37:1565-78.
- 33. Msefula D. How can growth monitoring and special care of underweight children be improved in Zambia? *Trop Doct.* 1993;**23**:107-12.
- 34. WHO. A critical link. Interventions for physical growth and psychological development. A review. *Geneva: WHO*, 1999.
- 35. Kolsteren PW, Lefèvre P, Lerude M-P. Nutrition rehabilitation and the importance of the perception of malnutrition in the follow-up of rehabilitated children. *Asia Pacific J Clin Nutr.* 1997;**6**:106-10.
- Launer LJ,.Habicht JP. Concepts about infant health, growth, and weaning: a comparison between nutritional scientists and Madurese mothers. Soc Sci Med. 1989;29:13-22.
- Lovel H, Graaf Jd, Gordon G. How mothers measure growth. Community dimensions for expanded growth monitoring in Ghana. Assignment Children. 1984;65-68:275-90.
- Tonglet R, Lembo EM, Zihindula PM, Wodon A, Dramaix M, Hennart P. How useful are anthropometric, clinical and dietary measurements of nutritional status as predictors of morbidity of young children in central Africa? *Trop Med Int Health.* 1999;4:120-30.
- 39. Cape N. Growth charts: help or hindrance? Observations from rural Bangladesh. *Health Pol Plann.* 1988;**3**:167-70.
- Fagbule DO, Olaosebikan A, Jolayemi ET. Mothers as agents of growth monitoring: implications for widespread community growth monitoring. *Afr J Med Med Sci.* 1991;20:41-7.

HEALTH PROMOTION PRACTICE OF RURAL HEALTH WORKERS IN BOLIVIA - A QUALITATIVE EXPLORATION -

Tom Hoerée¹, Edgar Zambrana², Edgar Sejas³

Introduction

The child health card or the growth chart as promoted by and UNICEF since the sixties, has been criticized since many years and at different occasions (1-4). One major objective, that has been put forward in programmes advocating the use of the card, is that it should assist health personnel and community workers in health education and communication about child health (5). Or in other words that it should help them in their child health promotion practice. The card is then proposed as the main or central tool around which this practice should be organized. Few are the recommendations on how health education and communication should or could be practiced. A concept or framework on how the communication should be practiced is clearly lacking. The consequence is that it is difficult to evaluate the quality of the education and communication that takes place. In this paper we briefly present a framework for consultation - called the patient centered approach developed by family medicine (6)- in which the modes of communication between practitioner and patient are better outlined. The explicit aim of this approach is to assist health personnel in their role of promoting the self-caring capacity of patients.

The aim of the paper is to explore in how far health personnel are practicing a patient-centered approach without been explicitly thought. The underlying hypothesis being that if elements of this approach can be found in the current practice of the health workers, then these could be used to build upon when designing specific interventions for enhancing a more empathic and responsive or patient-centered health promotion practice.

¹ Nutrition and Child Health Unit, Institute of Tropical Medicine, Antwerp, Belgium

² Faculty of Sociology, San Simon University, Cochabamba, Bolivia

³ Faculty of Medicine - Unit of Nutrition, San Simon University, Cochabamba, Bolivia

Methodology

Transcripts from semi-structured interviews on the concepts and practices on promotion of health, growth and development of children under five of health personnel were re-analyzed. A question also probed on how the health card assisted them in health promotion. Two auxiliary nurses (AN1&2: *references in citations*), one licensed nurse (HN) and two doctors (GP & DIR) working at a rural health centre in Chapare district (Cochabamba province -Bolivia) and one auxiliary nurse (AN3) working at the health post depending of the centre, were interviewed.

The framework on patient-centredness as proposed by Mead & Bower, was used for coding and for organizing the results (7). These authors discern five dimensions of this approach: the biopsycho-social perspective, the 'patient-as-person', the sharing of power and responsibility, the therapeutic alliance and the 'doctoras-person'. Citations were coded under the "bio-psycho-social perspective" when personnel talked about the definition or determinants of child health, growth and development. The code "patient-as-person" was attributed to citations where health personnel talked about their own versus the parents' explanatory models of child health and when they indicated their attitudes towards those of the parents. The dimension of "sharing power and responsibility" was investigated by reviewing all the examples given of their daily health promotion practice. Elements of listening and responding to questions with or without the help of the health card were considered as more patient-centered. The "therapeutic dimension" was elicited by checking on how appointments were made and follow-up visits planned. And elements of the "doctor-asperson" dimension were found in citations where personnel commented on the feasibility of integrating health promotion into their daily practice.

Results

The bio-psychosocial dimension

Conceptually child health is understood by all the health personnel interviewed as having biological and psychosocial dimensions. Still as good nutrition, absence of disease and good growth are presented as basic conditions for ultimately a normal development, it seems that most see a hierarchical relation between health, growth and development. In practical terms, growth is equated with measurements of weight and height and development with the assessment of milestones. The importance of constitution, environmental factors - esp. the family environment - and economical factors in child health are all well understood.

Ok, health, growth and development of a child, well, I think that those three go together, no? Because when a child is sick, when he has no full health, that child cannot grow and he cannot develop as well, no? To me, health goes together with growth and development. [AN3, 51]

And health will have an influence on both, because when health is good, growth is equally good and if this is good, development of the functions will also be good. [GP, 72]

As for the 'social' we can speak of those that do not have a relation with other children and ... but that could also be because their mothers forbid them to eat what they want, because there is no money. Meaning that they do not have sufficient revenue for being able to eat what any other child can eat. [AN3, 33]

To me, child health means that the child is in good health, protected against disease, that all his rights and needs are well respected, because child health that does not only mean to have everything at home, money. Health means also affection and protection. [AN1, 68-69]

Listening to their conceptual framework, one would believe that they really have a global view, but listening to how these concepts are translated into daily work, their biomedical orientation becomes clear. Most of the activities they report are related to prevention of disease via vaccinations or informing about diarrhoea or to promotion of good nutrition [citations see under C- Sharing power & responsibility].

These observations did not differ as per educational level of the interviewees. The only difference being that the higher educated - doctors and head nurse - gave more detailed accounts of their thoughts and concepts.

The 'patient-as-person' dimension

The health personnel did not show a highly understanding attitude towards the child rearing practices of the parents. One bluntly said parents are ignorant while another more politely commented that they do not have a conceptual base on child health needs.

No as for growth and development, they do understand. This is a problem that should be resolved! [*DIR, 61*]

I do not think they have a conceptual base for the fact that development is something psychological or intellectual [HN, 178]

But when asked whether they ever discussed these with the parents, none answered directly except one who exclaimed with surprise, "ooh, I never asked..." [AN1, 280]. None indicated much understanding of the parents' difficult life conditions either. As the fact that parents mainly use the health centre when the child is seriously ill and that they do not attend regularly to the healthy baby clinics was interpreted as a lack of understanding and concern and less as a lack of time or resources.

Most often times they bring their children when they are seriously ill, and in the end, they are not concerned about the health of their children. In any case, a number of mothers ... [AN2, 109]

The 'sharing of power and responsibility' dimension

Health promotion is understood primarily as transmitting messages that have to be captured by the mothers. The responsibility of the health personnel goes no further then making sure that the message can be repeated. Health personnel clearly expect the parents to closely follow even 'comply with' their advice, which in their opinion is rarely the case.

Well, when I explain something to them, they understand me as they say "yes, I understood, you said so and so". So, they repeat, meaning that they say what I said them, then I know for myself that these mothers have well understood. [AN3, 123]

There are a few indications that health personnel respond to questions of the mothers. Doctors seem to have a relative advantage over nurses, as within the cabinet they seem to dispose of a bit more time and privacy. Nurses have fewer opportunities of these one-to-one contacts.

So, they themselves open up mentally, and they say things, they suggest others, so you have to accommodate. You feel it when there is interaction with the mother. [GP, 210]

Well, I tell them this in relation with the problem they came for. When they came for diarrhoea, I tell them to wash their hands, ... I tell them that in relation with the pathology for which they consulted and then I try to orient them. [GP, 307] Two nurses indicate that on a few occasions they were able to listen and respond to questions of mothers.

... In two communities we have organized meetings with the mothers. So, they told us that their children could probably have diarrhoea. So, they told us that sometimes this is because of the dirty water.... So, we gave them an orientation saying that they should first let sediment the water. Then, to boil the water without the deposits. ... All this, so that they could use it and not to drink directly from the river. That is what we told them concerning the diarrhoea, that the water of the river is not good because we know that troubled waters are bad. [AN3, 71]

While I am weighing and measuring the patient, I discuss with the mother. ... I ask her questions on health, whether they told her about vaccinations, growth and development of her child. If she was told already, she explains to me what she knows and I argument bit by bit and I complete what she does not know. [HN, 257-264]

So time availability, opportunity and willingness of the personnel seem to determine whether a certain amount of power and responsibility is shared. The health card does not seem to aid in creating opportunities for listening and responding, rather on the contrary its use more oftentimes leads to transmitting health messages without asking any questions.

So, I show the mother that the weight is going down and I tell her: "the weight of your child is decreasing, that is not good, you do not nourish him well, you should improve on that". [AN1, 190]

The 'therapeutic alliance' dimension

All health personnel interviewed complained about the lack of cooperation by the parents in the follow-up of treatment or the lack of adherence to the vaccination or weight control schedule. It seems that in the perception of the health personnel, the parents do not keep their part of the agreement.

They only come to the health centre when their child is very ill. I mean, they do not come in time for their controls. When the child is healthy and does not become ill, they never set a foot on the doorstep of the centre. They are more regular when their child is frequently ill. Rare are the mothers that come for the controls of their child and I think that they rather come because they feel obliged to ... [GP; 162-163]

The 'doctor-as-person' dimension

As already indicated, time availability is reported as a constraint to proper child health promotion. All complain about it, and in most examples cited where a certain amount of patient-centredness was present, time was less restrained.

Ok, when we went down there, we had conversations with the mothers because we were two nurses to do the job, so we have discussed. In two communities we have organized meetings with the mothers ... [AN3, 71]

Where some indicated a need for more training on the subject of child health, none indicated a need for training on better understanding the parents' perspective or on communication skills.

Discussion and conclusions

The three first dimensions of the framework on patientcentredness were fully covered by the interview script that was used during the interviews. Both remaining dimensions were not that well covered. This definitely leads to a partial picture on the level of patient-centredness of the health personnel interviewed and interpretation on these dimensions should be done with caution. However, from the analysis, the discrepancy between theory and practice of promotion of child health, growth and development is striking. Although their conception of child health is very comprehensive, the practice the health personnel reports is on the one hand clearly disease oriented and on the other hand strongly paternalistic in nature. This discrepancy is not surprising as medical education and socialization is known to stimulate these characteristics (8,9). Although far from being systematically practiced, four of the six persons interviewed clearly indicated strong examples of patient-centered practice. This means that to a certain degree an inclination or willingness is present and that with appropriate support this could be further developed into a more systematic practice.

There exists no literature specific to our subject of concern, but our results concur very well with the critique upon which the patient-centered approach was developed (10). Namely, that a clinical method is needed in order to incorporate more systematically non-biomedical concerns into the doctor-patient encounter and into medical decision making. This would mean that our observations are far from context specific and that it seems that we documented a problem that is rather linked to our scientific - rational or reductionist - way of practicing medicine. Encouraging is that the more comprehensive or 'holistic' concept of child health, growth and development is well known to the personnel interviewed. And that there is not much difference in understanding this between the higher and the lesser trained. What lacks is the integration of this concept into daily practice. As such the concept of patient-centredness could be introduced in medical and nursing schools and in continued education programmes for professionals.

Three topics seem in need of further elaboration and attention education and training programmes: in these а better understanding of the mediating role of the parents in child health, openness to the perspective of the parents and practical training on what advise to give on child development. The socio-economic determinants of child health are well understood but health personnel need to appreciate more the central and mediating role of the parents. In other words, they need to better understand the difficulties of parents in coping with these factors while trying to preserve the health of their children. This understanding will be facilitated when health personnel during their different training programmes also learn to see child health from the parents' perspective. Courses on different explanatory models and practical exercises on communication skills are some of the methods that can be used to sharpen their empathic abilities and lessen their paternalistic attitude.

The third topic that should be better covered in these programmes is on how to translate the concepts of child development into practical advice. As for nutrition, advice on how to stimulate psychomotor and social development needs to be adapted to the opportunities and possibilities of the local reality. Local medical and nursing schools should take a leading role here.

A final remarks is that all this training and reorientation will not be successful if the conditions of daily practice are not made more conducive for meeting and discussing with parents. As indicated by the interviewees, time availability is an important factor, but a reorientation in the assessment of health worker performance is probably a more important precondition. Measurements of performance should then use fewer indicators of coverage and more of patient satisfaction.

References

- 1. Cape N. Growth charts: help or hindrance? Observations from rural Bangladesh. *Health Pol Plann.* 1988;**3**(2):167-170.
- 2. Dixon RA. Monitoring the growth of the world's children. Ann Trop Paediatr. 1991;**11**:3-9.

- 3. Garner P, Panpanich R, Logan S. Is routine growth monitoring effective? A systematic review of trials. *Arch Dis Child.* 2000;**82**(3):197-201.
- 4. Gerein N. Is growth monitoring worthwhile? *Health Pol Plann.* 1988;**3**(3):181-194.
- 5. WHO. The growth chart. A tool for use in infant and child health care. *Geneva: World Health Organization*, 1986.
- 6. Lewin SA, Skea ZC, Entwistle V, Zwarenstein M, Dick J. Interventions for providers to promote a patient-centred approach in clinical consultations (Cochrane Review). *Cochrane Database Syst Rev.* 2001;**4**:CD003267.
- 7. Mead N, Bower P. Patient-centredness: a conceptual framework and review of the empirical literature. Soc Sci Med. 2000;**51**(7):1087-1110.
- 8. Hahn RA. Sickness and Healing: an Anthropological Perspective. *New Haven and London: Yale University Press*, 1995.
- 9. Helman CG. Culture, Health and Illness: An Introduction for Health Professionals. 3th ed. Oxford: Butterworth-Heinemann, 1994.
- Fehrsen GS, Henbest RJ. In search of excellence. Expanding the patient-centred clinical method: a three-stage assessment. Fam Pract. 1993;10(1):49-54.

SOCIAL REPRESENTATIONS AND MEANINGS OF INFANT HEALTH LESSONS FOR HEALTH EDUCATION¹

Emma Rubín de Celis Talavera², Iris Pecho Mangiary², Eduardo Vidal Soto², Nancy Suárez², Ruth Velarde²

Introduction

The project "Hacia un Enfoque Integral de la Salud Infantil" (Towards an Integral Approach to Infant Health) taken place from 1999 to 2001 in Bolivia and Peru, supports itself on two affirmations: first, that the health of infants less than 5 years of age, not only depends on the technical quality of the health care providers but also on the knowledge and practices of the parents and caretakers; second, that the doctor/caretaker relations are always considered as interactive encounters between the two actors, even when one of them appear to have a passive attitude.

The research and intervention activities had two goals: 1) discover the knowledge and practices based on social representations and meanings that mothers, fathers and caretakers give to infant growth and development; 2) understand what was the logical framework of the social representations and meanings and how it influences the infant's growth and development.

This presentation picks up the analysis of the main results in the research and intervention stages that occurred in Peru in two characteristic geographic and demographic areas of the Department of Lima: 1) marginal-urban; and 2) rural. The contacts with the mothers and caretakers were done through home visits where 125 in depth interviews were performed with a semi-structured interview guide; additionally, 12 focus groups were done. During the intervention phase, 5 monthly meetings took place for a 6

¹ The project "Hacia un Enfoque Integral de la Salud Infantil" (Towards an Integral Approach to Infant Health) has been financed by the European Economic Union International Cooperation. The Institute of Tropical Medicine of Antherwp (Belgium), the Research Institute for Development (Institut de Recherche pour le Développement) (France), San Simón University (Cochabamba-Bolivia), Peruvian University Cayetano Heredia (Lima-Perú) have participated in partnership in its conception and execution.

² Universidad Peruana Cayetano Heredia, Lima, Peru

months period with a total of 100 mothers and caretakers who came from different areas in the districts of Carabayllo and Independencia, in groups of 15 to 20 caretakers.

It is neither our intention to do a description of the representations and meanings that the parents and caretakers have about the health of their children nor only report the practices that they develop in order to take care of their children. We are interested in sharing the reflections and thoughts that were elaborated, constructed through the constant dialogue with the caretakers and the lessons that we got out of this dialogue.

Context

In order to facilitate the understanding of these reflections, thoughts and lessons, we will describe briefly where the families live and what they do to survive. Independencia is a district since the mid 60's, located in the periphery of the city of Lima. The constant battle of their inhabitants has accomplished an improvement in their living conditions such as roads, basic infrastructure, schools, etc., in the initially settled areas; while the areas that have recently been settled into, do not have these services. Commerce and small scale industry dominate the productive activities of the families and their income places them in the poverty socioeconomic stratum. In Carabayllo two rural areas were taken: Chocas and Rio Seco. In the former, families own small parcels of land for farming; and, eventual workers or day laborers, who work for these family owned agricultural parcels, live in the latter. The income that they obtain situates them in the poverty and extreme poverty strata, respectively. The majority of the housing is constructed with "adobe" and reed mats and do not have the basic services of water and sewage.

The origins, cultural heritage and acquired knowledge

The origin of the families varies. In Ermitaño some families are fourth generation residents of immigrant origin and very few are of recent immigration; while, in Chocas and Rio Seco, there are more families product of very recent immigration. Although all families have had some contact with the health care centres of the official public health care system, the acceptance of their norms and suggestions with respect to the care of the children, will vary according to whether they had more or less contact with these health services. The concepts and care suggested by the health professionals not always become part of the caretakers' conceptual and practical baggage, because, firstly, this new knowledge/wisdom does not necessarily unearth the ancestral knowledge/wisdom on this subject, and, secondly, because there are factors other than knowledge/wisdom that define the behaviour of the caretakers. An illustrative example of this could be the necessity of baptizing the child, as a protective element of his or her life, which could limit some practices of the psycho-motor development; but, that at the same time, it may also represent an economic strategy of survival for the child or the family. This is so because the godfather has, as an inherent responsibility, the care of the godson or goddaughter and of his or her family. The medical knowledge coexists without conflict with the caretakers' knowledge or changes in terms of meaning in everyday practices as is in the case of the concept of "balanced diet", which is perceived only as a dense diet without taking into consideration the quality of the food.

The more relevant components of the social representations and meanings with respect to health/disease and growth and development of infants less than 5 years old

The health - disease process

Defined by the caretakers' observations of child's changes in conduct, state of mind, in his or her appetite and also by the caretakers' capacity to manage certain alterations and changes, without having to use external competencies or resources. This definition gives way to two concepts about health: a) **"healthy"** meaning happy, playful and with appetite; and b) **"healthy but..."** meaning the former but including some sings or symptoms of illness that can be managed at home. Lastly, **"Disease"** meaning when the signs and symptoms can not be treated at home. The child has to be treated by external healers (traditional or western).

The indicators of proper growth

Importance is not given to height with respect to age according to standardized measures. The comparison is made with respect to the parents themselves. "She or he can't be tall if her or his parents are short". The idea of genetic determinant over nutritional determinant. The weight has the same explanation; although, in this case there is a relationship with nutrition, but not in terms of quality but in quantity. "Doesn't want to eat" or "Yes, he eats a lot". In these and other explanations, we may note that what is dominant in the logic of the explanation is fundamentally the relation with what is "naturally" (biologically) before of what is "socially" determined. The genetic component or the quantity of the food is natural or rather biologic, while the nutritional quality is a socially structured concept (accessibility).

Exclusive breastfeeding and weaning

While exclusive breastfeeding is not changed by the different liquids that are given in small amounts, "agüitas"; it is so by the work of the mother (day laborer who can not take the child to the field). According to her, the weaning stars at 6 months and do not consider as such the small amounts of adult food that is given from 2 to 3 months "because he wants it" ("porque se antoja") or "so that his stomach starts getting used to adult foods" ("para que su estómago se vaya acostumbrando a la comida de los adultos"). Prolonged breastfeeding for more than 2 years hide behind multiple reasons that go from the mother being unconsciously opposed to breaking the emotional and social dependency with the child - "poor baby, I feel sad that he cries" ("pobrecito me da pena que llore")- to purely economic reasons – "so that he doesn't cry of hunger" ("para que no llore de hambre") or "so that he gets stuffed because we don't eat at night" ("para que se llene, porque como nosotros no comemos de noche").

Acceptance or rejection of some foods

Fundamentally, economic factors (money or time) define the meals (kinds and amounts of food) of a family. A general proof is that except for the almost exclusive breastfeeding phase (without the "aguitas"), the mothers do not prepare a different menu for the children that are less than 5 years old. It is the adults' potato or spaghetti that becomes the mashed food ("papilla") for the child before teething. The adults' meal is predominantly made up of carbohydrates; so, for this reason, they justify the lack of foods rich in proteins such as chicken or fish with explanations like it is "harmful" for de child (in the case of chicken or fish). The first as bad specifically for boys because the chicken has been bred with hormones and may turn the boy into a girl. The second, of which is accepted as having the trait for developing the intelligence of the child, is dangerous when he or she has some wound. A more in depth investigation led to the discovery that both foods are expensive for the family or forces the mother to "spend" ("gastar") more time in preparing them.

The proposal of and experimentation with adequate foods for the child which are less expensive and are within available resources will be introduced permanently if the adults, specially mother, like them (the case of processed blood, " sangrecita"), if preparation does not demand too much time of caretaker or mother and if favourable results are visible in the short term.

The adequate stimulation and support for child development has its difficulties with respect to the psycho-motor, language and emotional aspects because of lack of time by the caretakers due to limitations of the context, predetermined ideas concerning gender and the importance of punishment, as an instrument of socialization. Even though all mothers know about some way of helping the muscular development of their children, they only do it when they have time. Some not so convenient customs or habits for the child such as tying up the hands or leaving them in a "walker" ("andador") or a "little corral" ("corralito") are explained as forms of helping the muscular development of the children; however, these hide the fact that in reality these are safety strategies that the mother utilizes, so that, she may do other activities while taking care of the child. The external conditions (soil floors, uneven terrain, etc.) turn these strategies into accident risk factors for the infant.

The communication and affection that the mother shows towards the child from before birth and during breastfeeding very rapidly turn into a dominance/ submission relationship after weaning or when another baby comes along. The support functions of socialization are rigorously carried out especially for the boys. These are explained as much by ideas about the need of authority, as by ideas about fearing the loss of manliness in the boys. These hide the fact that the child is seen dually by the parents; that is, he or she is a realization or fulfillment; but at the same time, an added workforce for the survival of the family.

The relation caretakers – health personnel is marked by a subordinate attitude by the caretakers making the communication and exchange difficult to happen. However, a change of attitude by the health personnel is not enough; what they needed to comprehend is the underlying rationality of the meanings and representations of the caretakers and their adaptation to the environmental, social and economic context.

Lessons

- ✓ We should consider the social representations and meanings of the caretakers as a complex product of: 1) the knowledge/ wisdom passed down from generation to generation; 2) the time; 3) the intensity of the contact with the professional medical model; the economic factors; and 4) the time that the caretakers have to spend with the infant less than 5 years of age. The functions that are fulfilled by these social representations are: a) legitimates and guides their practices; and b) defines and justifies the selection of changes that are acceptable or considers possible. The capacity of change is possible to enhance if it is taken into consideration more than one element of those which contribute to the construction of this frame/web of meanings and representations.
- ✓ The central characteristic of the body of representations and meaning about child/infant health and growth and development is that of the adaptation of beliefs and knowledge to: 1) the concrete context; 2) the time available by the caretakers; 3) the availability of economic resources; and 4) the degree of credibility of the external informant.
- ✓ The forms and styles of child/infant health care have taken us to reflect very closely about how inadequate and even futile, may be the form of vertical health education that prioritizes the transference of knowledge rather than the discovery and exchange of knowledge/wisdom. They made visible to us the necessity of using health education approaches that improves the encounter of cultures of the different groups involved in the interaction and transaction within in a climate of respect and comprehension in order to guarantee the processes of change not only in the caretakers, but, in the health personnel. Hence, the instruments utilized by the health personnel, such as the "carné" (growth en development booklet/chart), may achieve its original objective.
- ✓ Finally, the research and intervention experience permits us to confirm that the same interdisciplinary exigency that should characterize the research phase in this subject, should be considered as indispensable in the intervention phase. The recommendations and actions that come exclusively from the health/medical sciences body of knowledge will not change the situation of these children because the problem is an

interdisciplinary/transdisciplinary one, but, even more so if the living conditions of the families are not changed. The element of success is in working **with** (not for or instead of) the caretakers in the possible changes and support their struggles for more integral changes.

LOCAL PERCEPTIONS OF CHILD'S HEALTH, GROWTH AND DEVELOPMENT AMONG BOLIVIAN MOTHERS

Charles-Édouard de Suremain¹, Pierre Lefèvre², Bernard Maire³, Patrick Kolsteren²

Introduction

The results presented in this paper proceed from an interdisciplinary research project that aims at developing and applying a global and comprehensive approach to the health of under fives in Bolivia and Peru. This is an INCO-DC research project financed by the European Community and entitled Health sector reform: towards a more global approach of child health [n° IC18-CT97-0249 (DG12-WRCA)]. In this project, the socioanthropological, public health and nutrition components are the results of the sociocomplementary. However, only anthropological research carried out in Bolivia are presented here (1-4) for other results of the socio-anthropological research conducted in this project; (5) regarding the multidisciplinary approach of the project). The results from Peru are presented in another paper of this same volume (6).

The aim of this socio-anthropological research was to understand the reference frameworks and practices of mothers in relation to child health, growth and development. This latter theme has been largely covered in psychological, psychoanalytical and psychopathological studies, but has seldomly been investigated in a socio-anthropological perspective (7-11). Our main hypothesis is that an in-depth understanding of the mothers' perceptions and practices should lead to an improvement of the interventions targeted at the child within health care structures and populations (on similar perspectives (12)).

Our main research questions were the following: What does growth and development of children mean for mothers? What are their explanatory models for "normal" growth and development? What are the criteria they use to follow-up growth and development of their children?

¹ Research Unit "Nutrition, Food, Societies ", Institute of Research for Development, Montpellier, France and La Paz, Bolivia

² Nutrition and Child Health Unit, Institute of Tropical Medicine, Antwerp, Belgium

³ Research Unit "Nutrition, Food, Societies", Institute of Research for Development, Montpellier, France

After clarifying the local conceptions of "healthy" and "unhealthy" children, we will show how the body -and its transformations- is a marker of the general health condition of the child. We will then focus on the perceived milestones for growth and development, insisting particularly on walking acquisition and the passage to adult food. Finally, we will conclude on the contribution of the socio-anthropological approach for reaching a comprehensive understanding of local perceptions on child's health, growth and development.

Places of investigation and methodology

In Bolivia, the research was conducted in the urban periphery of Cochabamba (Chavez Rancho), the country's third-biggest town, and in the amazonian and rural region of Chaparé. Both regions are inhabited by a majority of Quechua-Aymara Indians. Both groups represent round 40% of the Bolivian population (13).

In the socio-anthropological research, we used three investigation tools: semi-structured interviews, in-depth interviews and focus groups (see Table 1). The fieldwork had a total duration of seven months (14, 15) regarding the justification and utilisation of these different investigation tools in the context of the project).

Results: Perceptions of health, growth and development

"Healthy" children vs. "unhealthy" children

In both contexts, Quechua-Aymara mothers use the notions of "growth" or "development", or "health". But these have very different meanings depending on the topics with which they are associated (environment, food, disease, gender, age).

Simultaneously, mothers use broad notions such as "healthy child" (niño sano) or "unhealthy child" (niño no sano) that allow to indicate more precisely the perceived contents of the notions of health, growth and development. These include physical and behaviour characteristics that the mothers spontaneously mention.

Changes in the general behaviour of the child (sleeping troubles, screams, excessive crying) are serious signs of "disease". The fact that a child does not eat normally is also an important manifestation of a "disease". If the child vomits it is a sign of severity, mostly because its physical appearance is altered (thinness, loose stomach skin). In these cases, mothers say that their child is "sick" (enfermo), without necessarily mentioning the disease in question:

Table 1: Semi-structured interviews, in-depth interviews and
focus groups held with mothers of under-five children
in Chaparé and Chavez Rancho

Semi-structured		
interviews		
Number	Places	Dates
117	Chaparé	Sept. 1998 to Feb. 1999
112	Chavez rancho	Sept. 1998 to Feb. 1999
Total 229		

In-depth interviews		
Number	Places	Dates
19	Chaparé	March 2000
9	Chavez rancho	March 2000
Total 28		

Focus Groups		
Number	Places	Dates
4	Chaparé	Sept. 1998 / May 2000
4	Chavez rancho	Dec. 1998 / May 2000
Total 8		

When he is sick, he does not want to play, he only wants to eat sweet things; and this means that he is not well (Chaparé).

By contrast, whatever its age, characteristics of a "healthy child" are that he is not sick, eats well, "moves", plays and sleeps well. As a mother says:

When he is very chubby and he is happy, when he runs in all directions and is always joyful, and when he also does not complain much, that is because he is healthy (Chavez Rancho).

The body as a marker of the child's general condition

The answers mothers give to the question: "How does a child that grows and develops well look like?" show that they regularly observe the body of their child. They spontaneously qualify him as "beautiful" (bonito or lindo), "good" (bueno), "fat" (gordo), "wellformed" (bien hecho), "joyful" (alegre) and of course as "healthy" (sano).

Data on the image that mothers themselves call a "beautiful well-formed body" (un buen cuerpo bien hecho) highlight a large homogeneity in the perceptions (16-20) on the anthropology of the

body). Summing them up, we can say that a "beautiful well-formed body" must be harmonious, tending to some corpulence that is well distributed all over the body. The child that develops normally does not have to be tall, but rather well proportioned. Contrarily to what is commonly said by mothers in Europe, and according to what D. Bonnet reports in another paper (21), its age is rarely connected with its weight and height (for complementary observations in other contexts (22,9).

As long as a child is neither too fat nor too thin, its growth and development are thought as harmonious.

In the perceptions of the "well-formed beautiful body", the reference to the weight appears frequently but is rarely translated into kilos. Mothers "feel" or "see" when their child does not have a normal aspect. To them, the absence of disease combined with the harmonious distribution of weight all over the body is what certifies normal development. On the contrary, rare are the allusions to the children's height, and even rarer to low height in relation to age.

Body transformation factors

Illness episodes

Among the specific diseases affecting the transformation of the child's body, diarrhoea is frequently mentioned. Also, many mothers link the loss of appetite to malnutrition and anaemia, hesitating however on whether it is a cause or a consequence of loss of appetite. Bad growth is associated with loss or stagnation of the child's weight, sometimes with a problem of height. Whatever the causes, fever is not only perceived as a real disease, but also as a disease provoking thinness.

Generally, mothers use biomedical notions (anaemia, malnutrition), giving them sometimes a very specific, and other times a very broad meaning, using them a little like categories in which one can put anything.

Children are not well when they have a severe disease, that is to say anaemia, or else diarrhoea, because they cannot eat; when they eat no food, they cannot develop (Chavez Rancho); [Children] eat neither food and they get it [anaemia] (Chaparé).

Food practices

For the mothers, poor nutrition -regarding quality as well as quantity- also has immediate consequences on a child's health, and consequently on the transformation of its body.

To the question of whether there is a relation between a child's nutrition and its growth, most of mothers assert that a good

diet implies good health and normal development. By contrast, a child receiving little good food shows physical signs that associate excessive thinness with weakness. The unhealthy child would be kind of "de-structured" in his feeding behaviour. This destructuration may lead to what mothers call "malnutrition".

Other factors of body transformation

To the question of whether the psychological state of the child has an influence on its development, answers remain extremely vague. A mother explains that psychological aspects, since they are not visible, do not "say" much, as opposed to body signs, especially the fact of growing.

Main perceived stages of child's growth and development

When asked what are the decisive stages of child growth and development, few mothers mention motricity, increased attention, secondary movements or language acquisition. Contrary to this, most mothers clearly identified walking acquisition and consuming adult food as fundamental milestones in the development stages.

Walking acquisition

In the local perceptions, walking acquisition (between eight months and one year) is not preceded by the phase of crawling. Mothers particularly apprehend this very phase when the child is at risk to get infections or to hurt himself. To avoid these risks, it seems that women absolutely want to speed up the walking process by introducing very firm incentives.

He did not walk upon all fours; none [of my girls] has ever walked upon all fours; they went from the sitting position to the standing position to walk; they never crawled; my oldest girl had her walker and she used to walk only with it; the other one was sitting on her chair, but I never put her on the floor (Chaparé).

In practice, women carry the children on their back, wrapped in local woven cloth. When it is no longer possible, they leave them in baby-walkers so that they can stand up and be at their reach.

Transition to adult food

Transition to adult food is also perceived as a major milestone of child development.

According to observations, dietary supplements or adult foods are introduced from the age of 3 months or even sooner. Mothers also prepare the dishes cooked for the adults in a suitable way for the children, but they seldom cook specific dishes for them. (...) some children, already when they are two-month-old, when they see what we are eating [we give them soup] (Chaparé).

Well, [my child eats] only what we eat: rice, noodles, noodle soup with egg, that's it (Chaparé).

Data shows that definitive weaning occurs between the ninth and the twentieth month and in a rather abrupt way. The appearance of the teeth is sometimes decisive for definitive weaning. But mostly, following the advice from their own mothers or mothers-in-law, mothers apply salted substances on their nipples to speed up the weaning. Some women leave their child over night at their mother's place so that the end of the phase be well marked (23-27) on similar practices in Africa).

These weaning practices could be connected to the very firm incentives concerning the walking acquisition. The apparent aim seems to render the child autonomous regarding food, in other words to socialize him as early as possible.

The mothers' reference framework

Based on all these elements, we can assert that walking acquisition and passage to adult food are fundamental milestones of child growth and development. The passage of these two milestones -without negative consequences on the "beautiful well-formed body"- is decisive for the mothers to say that their child's growth and development is "good" or "bad".

Figure 1 summarizes the perceived causal linkages between the topics predominating the local perceptions and aims to replace growth and development milestones in a more global comprehensive framework.

Figure 1: The mothers' reference framework on child's growth and development



These perceptions and links form the mothers' reference framework are expressed in the "beautiful well-formed body". They give sense to the child's health, growth and development, as well as to the food and health-care practices associated with it.

Judging by our results, Quechua and Aymara mothers clearly have a different perception of children's well being than the biomedical model underlying monitoring activities in health centres. To them, measuring height and weighing are not prioritized expectations and do not correspond to their demand. There is a deep inadequacy between their vision and the technical viewpoint of the health professionals, as it has also been said in P. Lefèvre's paper (28).

As a general rule, the biomedical vision of occidental inspiration tends to fraction reality and health interventions targeted towards the child (psychomotor development, nutrition, health prevention, curative care, and so on). On the contrary, the data presented here emphasize the necessity to adopt a global and comprehensive approach towards child health that takes into account local reference frameworks. Since a global approach on child health integrates biomedical objectives and lay reference frameworks, it must allow narrowing the gap between logic of action and thinking that are very different from each other.

The necessity to adopt a global approach on child's health explains why we prefer not to refer to some kind of "nutritional" or "medical" anthropology. For us, socio-anthropology does not consist of a specialized branch of nutritional or medical sciences which purpose would only be to assist these disciplines in resolving technical problems. The contributions of socio-anthropology go much further.

As a matter of fact, this contribution appears to be particularly well adapted to highlight the rationality, the syncretic and complex character of local perceptions and practices (examples of such integrated vision (29-36). At a more general level, if it is applied within a participatory action-research framework, the socioanthropological approach can provide new coherency where some actors do not see any and concretely contribute to the improvement of child's health (37,38) on participatory action-research).

References

- 1. Suremain (de) CE, Lefèvre P (Ed.). Rapport du volet socio-anthropologique (Bolivie). La Paz: Institut de Recherche pour le Développement (IRD), 1999.
- 2. Lefèvre P, Hoerée T. Étude de la perception du Carnet de Santé Infantile et de son utilisation chez la mère de l'enfant de moins de cinq ans en Bolivie à travers la technique des groupes de dicussion focalisée. *Antwerp: Institute of Tropical Medecine (IMT)*, 2000.
- 3. Suremain (de) CE. Croissance, développement, santé et relations à l'alimentation. Étude des perceptions de la mère de l'enfant de moins de cinq ans en Bolivie à travers la technique des entretiens semi-directifs (Chaparé et Chavez Rancho). 2 volumes. La Paz: Institut de Recherche pour le Développement (IRD), 2000.
- 4. Suremain (de) CE, Lefèvre P, Pecho I. Les relations du genre soumises à l'épreuve de la maladie de l'enfant. Exemples boliviens et péruviens. *Recherches Féministes*. 2000;**13**(1):27-46.
- Rubín de Celis E, Lefèvre P, Suremain (de) CE, Kolsteren P. Transdisciplinarity in practice. Lessons from an international action-research and development project. In : "Proceedings of the International Transdisciplinarity 2000 Conference" (Transdisciplinarity: Joint Problem-Solving among Science, Technology and Society), Workbook II (Mutual Learning Sessions). Zurich: Swiss Federal Institute of Technology, 2000;124-128.
- 6. Rubín de Celis E. Meanning of growth and development for caretakers and health service providers in Peru (present volume).
- 7. Dettwyler KA. Growth status of children in rural Mali: implications for nutrition education programmes. *Am J of Hum Biol.* 1991;**3**(5):447-462.
- 8. Dettwyler KA. Throwing a curve at growth charts. Conference papers "Breastfeeding: the natural advantage. Nursing mother's association of Australia". *Sydney*, 1997:56-61.
- 9. Pelto GH, Pelto PJ. Small but healthy? An anthropological perspective. *Human Organization*. 1989;**48**:11-15.

- 10. Valsiner J (Ed.). Child development in cultural context. *Toronto: Lewiston, N.Y.*, 1989.
- Pfeiffer J, Gloyd S, Li LR. Intrahousehold resource allocation and child growth in Mozambique: an ethnographic case-control study. *Soc Sci Med.* 2001;**53**(1):83-98.
- 12. Hahn RA. Anthropology and the enhancement of public health practice. In: Hahn RA (Ed.): "Anthropology in public health. Bridging differences in culture and society". Oxford: Oxford University Press, 1999:3-24.
- 13. Tamisier JC (Ed.). Dictionnaire des peuples. Sociétés d'Afrique, d'Amérique, d'Asie et d'Océanie. *Paris: Larousse*, 1998.
- 14. Lefèvre P, Suremain (de) CE, Rubín de Celis E. Investigación socio-antropológica clásica, focus groups y modelo causal. Experiencias y reflexiones sobre algunas combinaciones metodológicas innovadoras desarrolladas en Bolivia y Perú. *Revista Electrónica de Epistemología de Ciencias Sociales.* 2000;9 (http://rehue.csociales.uchile.cl/publicaciones/moebio/index.html).
- 15. Lefèvre P, Suremain (de) CE, Rubín de Celis E, Sejas E. Combining techniques: The use of the causal model as a support for focus group discussions in a socioanthropological research on the differing perceptions of caretakers and healthprofessionals on child's health. In: "Proceedings of the Fifth International Conference on Social Science Methodology (CD-ROM)". *Cologne (Allemagne)*, 2000.
- Staffieri J. A study of social stereotype of body image in children. J Pers Soc Psychol. 1967;7(1):101-104.
- 17. Blacking J (Ed.). The anthropology of the body. London: Academic Press, 1977.
- Lock M. Cultivating the body: anthropology and epistemologies of bodily practice and knowledge. Annu Rev Anthropol. 1993; 22:133-155.
- 19. Jamard JL, Terray E, Xanthakou M (Ed.). En substances: textes pour Françoise Héritier. *Paris: Fayard*, 2000.
- Le Breton D. Anthropologie du corps et modernité. Paris: Presses Universitaires de France, 2001.
- 21. Bonnet D. Malnutrition: A subject-matter for anthropology (present volume).
- Garine (de) I. Massa et Moussey: la question de l'embonpoint. Autrement. 1987; 91:104-115.
- 23. Bond J (Ed.). Infant and child feeding. New York: Academic Press, 1981.
- 24. Dupuis A. De la conception au sevrage chez les Nzebi du Gabon. Journal des Africanistes. 1981;**51**(1-2):126.
- 25. Hull V, Simpson M (Ed.). Breastfeeding, child health, and child spacing: cross cultural perspectives. *London: Croom Helm*, 1985.
- 26. Dettwyler KA, Fishman C. Infant feeding practice and growth. Annu Rev Anthropol. 1992; **21**:171-204.
- 27. Suremain (de) CE. Dynamiques de l'alimentation et socialisation du jeune enfant à Brazzaville (Congo). *Autrepart*. 2000;**15**:73-91.
- 28. Lefèvre P. Appropiation of the growth chart by mothers of under-fives in Bolivia (present volume).
- 29. Fitzgerald TK (Ed.) Nutrition and anthropology in action. Assen / Amsterdam: Van Gorcum, 1976.
- 30. Loudon JB. Social Anthropology and Medecine. London-New York-San Fransisco: Academic Press, 1976.
- Jerome N. Medical anthropology and nutrition. Med Anthropol. 1979;3(3):339-352.
- 32. Mitchell W. Changing others: The anthropological study of therapeutic systems. *Med Anthropol Newsl.* 1977;**8**(3):15-20.
- Comaroff J. Medecine and culture: Some anthropological perspectives. Soc Sci Med. 1978;12:247-254.
- 34. Foster GM. Applied anthropology and international health, retrospect and prospect. *Hum Organ.* 1982;**41**:189-197.

- 35. Dozon J-P. Le dilemne connaissance / action : le développement comme champ politique. *Bull APAD.* 1991;1:14-17.36. Pelto GH. Continuities and challenges in applied nutritional anthropology.
- Nutritional Anthropol. 2001;**22**(2):16-22.
- 37. Fals-Borda O, Rahman MA (Ed.). Action and knowledge: breaking the monopoly with participatory action research. *New York: Immediate Technology/Apex*, 1991.
- 38. Cornwall A. What is participatory research?. Soc Sci Med. 1995;41(12):1667-1676.

APPROPRIATION OF THE GROWTH CHART BY MOTHERS OF UNDER FIVES IN BOLIVIA

Pierre Lefèvre¹, Tom Hoerée¹, Edgar Sejas², Charles- Edouard de Suremain³, Edgar Zambrana⁴

Introduction

International agencies, governments and NGO's promote the growth chart as an essential tool of GMP programmes. The underlying assumption is that the use of the growth chart could facilitate the communication between health workers and caretakers on the nature of growth and development and on the consequences for the child of an incorrect or inadequate diet. Through GMP, health services also want to follow-up children to detect early malnutrition.

However in the scientific literature, the relevance and usefulness of the growth chart is regularly questioned (1-3). These doubts are, on the one hand, technical (sensibility, sensitivity predictive value). On the other hand it has often been reported that mothers do not understand the growth chart very well (4-6). In a recent paper, D. Morley (7) stated that the tool is difficult to use and understand by the mothers and he proposes a new tool as a solution. The usual explanation is illiteracy but is it really a question of capability to understand or is it rather a question of appropriation and interest? In other words are the mothers interested to follow-up the growth and development of their child using this specific tool?

Understanding and utilization of the growth chart by caretakers is however a central issue to reach this objective. In order to respond to this question different studies were undertaken, some of which are presented in this volume (8,9).

¹ Nutrition & Child Health Unit, Institute of Tropical Medicine, Antwerp, Belgium

² Institute of Bio-Medical Investigations, Faculty of Medicine, University Mayor of San Simón, Cochabamba, Bolivia

³ Research Unit "Nutrition, Food, Societies " Institute of Research for Development, Montpellier, France

⁴ Department of Sociology, University Mayor of San Simón, Cochabamba, Bolivia

The objective of the study presented here was to understand how mothers perceive the use and utility of the growth chart in Bolivia. Indeed little information exists on the perception of this tool by caretakers.

Our main research questions were the following: What does the health card mean for the mothers? Do they understand its objective and use? Do they use it? For which purpose? How? How do mothers understand the concept of growth monitoring? Is the health card an instrument that facilitates communication and dialogue between health personnel and caretakers?

Material and methods

In order to answer these questions focus group research (10-12) was conducted.

In May 2000, four focus groups were organized in the periurban zone of Cochabamba (Chavez Rancho and San Juan XXIII) and in the rural amazonian region of Chapare (Puerto Aurora and Puerto Cochabamba). Both regions are inhabited by a majority of Quechua-Aymara Indians. These two groups represent round 40% of the Bolivian population (13).

Participants were mothers of under-fives. The research team identified participants. The groups were relatively homogeneous in terms of the mothers socio-economic background. In the peri-urban zone, the 2 groups were however contrasted in terms of educational level. The mothers from San Juan XXIII had a higher educational level than those of Chavez Rancho.

A researcher from the University Mayor de San Simón of Cochabamba did the facilitation of the focus group discussions. He was selected for his knowledge of the Quecha language and his animation skills. On average, 15 mothers attended the groups. Examples of the last version of the health card of the Ministry of Health were shown to the mothers at the onset of the discussions.

All focus groups were tape-recorded. Data was translated from Quechua or Spanish in French and codified and analyzed with the support of the QSR Nudist version 4.0 software in ITM. A preliminary data analysis benefited from the comments of the three other researchers involved. Results

1. Mothers' perceptions and reported use of the health card

1.1. General perception

At the onset of the focus group discussions, when a health card was introduced to the participants, the spontaneously referred to it as a vaccination card.

[The nurses] call it the vaccination card; We do not know another name for it. [FG1 ; 81-82]

When we go to the doctor, they say: "And his vaccination card?" [fg1; 86-89]

This designation has to be related to the practical and main use of the health card made by the mothers and the health personnel that is the control of the vaccination schedule (see 1.3 and 2. below).

Data analysis also reveals that mothers consider the health card as an important document. They store them in envelops or plastic bags and keep it in a safe place in the house with other important papers.

1.2. Mother's understanding of the health card objectives

Mothers do understand the monitoring objectives of the health card. For them, the card is to be used to control and followup the vaccinations, the weight and to a lesser extent the height of the children. They spontaneously mention the measurement of weight and height.

To control the weight, of his vaccines, of his growth, for all that. [FG1; 230-231]

When the child is not (well) nourished, he falls sick, he weights less... He looses two kilos, one kilo or half a kilo. This is how to control. It's because he has to eat well. Sometimes he will loose weight or gain weight. This is how we see how he develops and grows. [FG3 ; 169]

Mothers express interest and expectations in the growth curve and do understand its growth monitoring purpose, although, as we will see, they do not use it for this. For some mothers, partly related to their educational background, understanding the growth curve however still is a problem. Participants from the focus Group of Juan XXIII had a better understanding of the growth curve. It would be good that they explain us a bit more on this subject, because many among us, we say that we know, but in reality, we do not understand the use of all these lines and curves, why they go up or why they go down... [FG3; 214]

What might be more important is that mothers express interest and expectations in the growth and development of their children. They would like to better understand

1.3. Mother's reported use of the health cards

Mothers say they use the health card for two main reasons: vaccination of the child and in the case of illness episodes to have access to care.

We only use it when we have to have the baby vaccinated. [FG3 ; 220]

I think of it for myself for instance as a certificate, if I do not show it, they won't attend to me. [FG1 ; 235-237]

The practical use of the card as an "aide-memoire" for the follow-up of the vaccination schedule was often mentioned:

At what moment we have to bring him to the doctor, when we have to go for the vaccine. They even give us dates, so with this we know when we have to go. [FG2; 242]

According to the data, mothers do not seem to make a different use of the card for girls or boys. However the rank of the child in the family influences the use of the card. Mothers give much more importance to the health card of their first child.

Mothers report using the health card mainly the first year. This has to be related to its use for following-up the vaccination schedule.

In addition to the uses reported above, the health card has other utilities. Indeed, in Bolivia the card is also needed to enroll the children in school. Some mothers mention that they keep the card as a souvenir for their children later.

Very few mothers mentioned using the health card to followup growth and development of their children.

2. Use by the health personnel as reported by the mothers

The data gives profound insights on how the health personnel uses the health card. These results are in line with results presented elsewhere in this volume (8,9).

Mothers report that the health personnel mainly uses the health card as an administrative tool for following up the children's vaccination status, registering them at the clinic, and for allowing access to care whether it be preventive or curative.

The only thing he told me is that I should bring the card with me, that it serves to note down the dates of the vaccinations, the weight of the child and nothing else. He told me not to loose it as it is for his control. This, he told me the first time. [FG2 ; 361-365]

Here I follow the vaccinations, they gave it to me for that. [FG3 ; 47]

We take out the card only for having the children vaccinated and thereafter we put it away again. And when we have to go to the hospital, we take it out again and secure it again afterwards. [FG4 ; 568]

Just until he finished his vaccinations and thereafter, nobody asked for it anymore. [fg4 ; 270]

For the health personnel, the growth monitoring purpose is secondary. Few explanations are provided to the mothers regarding the information recorded on the growth chart. Interpretation of the chart, if any, is made by the health personnel.

A number of mothers complain that the personnel does not systematically plot the weight and height of the children on the curve.

We always did more or less what the doctor told us to do, but not while looking at the health card, saying "right, he is already here, this is the moment to start giving baby foods". No, not while looking at these [illustrations], but always while listening to the doctor, what he tells us, because, without doubt, he did not explain us the importance of these illustrations. [FG 1; 355]

Rude attitudes and poor communication skills of health personnel, as illustrated by the following quote, further hamper provision of information:

"How, madam, didn't you take it [the card] along?", ...like this, they tell us of ... then they open their mouth. Generally for telling us of, they are the first ones, but for giving us a good advice, that, that is rare, my good man. [FG 1; 776-780]

Discussion and conclusions

Although mothers express interest in matters related to growth and development of their children, they do not appropriate the growth chart as a tool for the follow-up. As such the card misses its health monitoring purpose and does not fulfil its role as a communication device between caretakers and health personnel.

The limited appropriation of the growth chart by the mothers seems to be partially induced by the health services themselves.

Three factors appear to play a major role in this limited appropriation of the tool by the mothers: a) the improper use and understanding of the chart by the health personnel; b) the lack of explanations provided to the mothers by the same personnel in relation with poor communicational attitudes.

In addition, as shown in an other paper in this volume (14), mothers rely on their own criteria to follow-up the growth and development of their children.

The study also indicates that the value of the growth curve can not be studied in itself, intrinsically and has to be considered in the more global context of the functioning of the first line health services. In the Bolivian context, improving the understanding of the growth chart by the health personnel, and more importantly, changing their attitudes and improving their communication skills is a pre requisite to any work on growth monitoring programmes.

Acknowledgements

The results presented in this paper proceed from an interdisciplinary research project that aims at developing and applying a global and comprehensive approach to the health of under fives in Bolivia and Peru. This is an INCO-DC research project financed by the European Community and entitled Health sector reform: towards a more global approach of child health [n° IC18-CT97-0249 (DG12-WRCA)].

References

- George S, Latham MC, Gerein N, Cervinsas J. The practice of growth monitoring. Lancet. 1992;340:918.
- 2. Garner P, Panpanich R, Logan S. Is routine growth monitoring effective? A systematic review of trials. *Arch Dis Child.* 2000;**82**:197-201.
- 3. Gerein N. Is growth monitoring worthwhile? Health Pol Plann. 1988;3:181-94.
- 4. Grant K, Stone T. Maternal comprehension of a home-based growth chart and its effect on growth. *J Trop Pediatr*. 1986;**32**:255-7.
- 5. Gerein N, Ross DA. Is growth monitoring worthwhile? An evaluation of its use in three child health programmes in Zaire. *Soc Sci Med*.1991;**32**:667-75.
- 6. Gopaldas T, Christian PS, Abbi RD. Gujral S. does growth monitoring work as it ought to in countries of low literacy? *J Trop Pediatr*.1990;**36**:322-7.
- 7. Morley D, Elmore-Meegan M. Let's move growth monitoring out of limbo. In: "Proceedings of the International Colloquium: Promoting growth and development of under fives". 28,29,30 November 2001. *Antwerp: ITGpress*, 2002; 253-259.
- Roberfroid D, Lefèvre P, Kolsteren P, Hoerée T. Health professionals' perceptions of growth monitoring and promotion programmes. In: "Proceedings of the International Colloquium: Promoting growth and development of under fives". 28,29,30 November 2001. Antwerp: ITGpress, 2002;58-71.
- 9. Hoerée T, Zambrana E, Sejas E. Health promotion with and without the child health card: practice of primary health care personnel in Bolivia. In: "Proceedings of the International Colloquium: Promoting growth and development of under fives". 28,29,30 November 2001. Antwerp: ITGpress, 2002;72-79.
- 10. Lefèvre P, de Suremain C-E. D'une attente à l'autre. Quelques réflexions méthodologiques sur l'implication et la contribution de la socio-anthropologie à la nutrition de santé publique. *Cahiers Santé*, 2002 (under press).
- 11. Krueger R. Focus groups. A practical guide for applied research. *Beverly Hills:* Sage Publications, 1988.
- 12. Dawson S, Manderson L. The focus group manual. Brisbane: Social and Economic Programme of the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases, 1992.
- 13. Tamisier JC (Ed.). Dictionnaire des peuples. Sociétés d'Afrique, d'Amérique, d'Asie et d'Océanie. *Paris: Larousse*, 1998.
- 14. De Suremain CE, Lefévre P, Maire B, Kolsteren P. Local perceptions of child's health, growth and development among Bolivian mothers. In: "Proceedings of the International Colloquium: Promoting growth and development of under fives". 28,29,30 November 2001. *Antwerp: ITGpress*, 2002;87-95.

IS FORMAL SCREENING MORE EFFECTIVE THAN TRUSTING MOTHERS' FEELING?

René Tonglet¹

Introduction

Formal screening for a lot of health problems is a standard component of any community child health service. Screening involves testing of apparently healthy children, to separate a group of subjects who are at high risk from a larger group who are at low risk. In most developing countries, growth monitoring (GM) is indeed promoted as a formal screening tool for under-fives, devoting very much time and effort; GM has however become controversial. Although it is perceived by some as the cornerstone of the so-called child survival revolution, to others it is an ineffective ritual (1-7). My personal experience over the last ten years of promoting healthy growth has taught me that the current policy of GM in developing countries is indeed questionable, and that alternative strategies should be considered for giving more attention to both the mother and the health worker on duty at the under-fives clinic. This paper aims to add value to such alternative strategies.

Absence of evidence, evidence of absence

It is well know that very low values of anthropometric indicators are associated with a high risk of mortality, as well as with a high incidence or a long duration of diarrhoea and other diseases among children (8-10). Severely malnourished children experience high rates of morbidity and mortality, and severe protein-energy malnutrition (PEM) is an indicator of bad prognosis particularly for children admitted to hospital (11, 12).

However, there is no research evidence of the value of nutritional anthropometry as a tool for the early identification of the child in need, and the precise nature of the association between moderate malnutrition - i.e. growth retardation affecting millions of children world-wide - and child's health is hardly clear (13). Among the studies, which have addressed the issue of avoidable death, two provided promising results from Asia (14,15), but three collected

¹ Epidemiology Unit (UCL 30.34); School of Public Health, Faculty of Medicine, Catholic University of Louvain, Brussels, Belgium

weak evidence from Africa (16-18). In addition, none of these studies has provided documentation that nutritional anthropometry would succeed in identifying children with a high risk of morbidity, despite the policy importance of such an issue.

In view of the accumulated results from the large number of available studies, current policies of routine growth monitoring appear to be based on yet unproven opinions and beliefs. Recently, David Hall (19) has reported that a group who met in Coventry, in 1998, to develop a consensus on growth monitoring did agree that growth monitoring was not performing well against the classic requirements for screening programmes. According to the conclusions of this meeting, routine growth monitoring should not be regarded as an effective screening tool, and has no proven benefits.

So far, this lack of evidence goes together with a very limited attention given to other possible screening tools and a very limited research agenda on alternative strategies to promote healthy growth. Interestingly, this has been clearly underlined into a Cochrane review by Panpanich and Garner (20). In this review, ten studies were identified for inclusion, but only two trials actually met the selection criteria, and only one really succeeded in assessing the impact of routine growth monitoring as compared with no growth monitoring. According to the reviewers' comments it is indeed surprising that there is so little research evaluating benefits and harms of growth promotion interventions.

News from the field

Unproven opinions and beliefs are useless for preventive medicine. We need facts. So, let me now consider the factual information that can be gained from three very different studies.

The first one is the only trial included into the review already mentioned. This study, conducted by George (21) in India, randomly allocated six pairs of villages to receive or not routine growth monitoring. About 550 under-fives were studied in the two groups, and, after 30 months of intervention, no difference in mean weight or height was detected.

This suggests that in a situation where the primary health care (PHC) system is functioning, GM provides no additional benefit as judged by anthropometry.

The second study I wish to point out has been carried out in rural central Africa (22-24). This cohort study involved 842 children under two years of age who completed weekly follow-up interviews and health examinations during three months. The main objective of this study was to evaluate the value of clinical, biological, anthropometric and dietary measurements as prognosis indicators of short-term morbidity among apparently healthy children. This study demonstrated that anthropometric indicators performed badly in predicting morbidity, and that, in contrast, other variables that were seldom controlled in previous studies appeared to be valuable prognostic indices for subsequent morbidity. Among these predictors three appeared to be particularly relevant: the information gained from the caretaker - i.e. the mother - on the adequacy of the growth of the child («do you think your child is growing well?»), on the current child's diet («how do you currently feed your child?»), and the occurrence of a morbidity episode during the preceding month («has your child been sick since the last visit?»). First, it is worth noting the accuracy of caretakers' responses to questions regarding the adequacy of the growth of their children. Growth failure is certainly among the health needs that are perceived by the caretakers. Next, it is useful to direct our attention on the feeding practices declared by the caretaker. The beneficial effects of exclusive breast-feeding are well known, but the detrimental effect of early weaning and long-lasting inadequate supplementation should not be overlooked. Finally, there is clear evidence that a child who suffers an episode of disease in the month preceding any observation period is more likely to become sick over the subsequent interval, as well as to experience growth failure. Careful recording of the medical history of the child at each encounter appears to be of utmost importance for the identification of the child in need.

For example, table 1 displays the logistic model fitted to the data on diarrhoea under 9 months of age. The dependent variable was the occurrence of at least one episode of diarrhoea by onemonth interval. The independent variables selected by stepwise regression were as follows: incremental height, child's diet, and occurrence of diarrhoea during the preceding month. Among older children, the set of predictors included: age of the child, time of enrolment into the study, adequate growth as judged by the care-taker, incremental weight for age, child's diet, and occurrence of diarrhoea during the preceding month. Similar figures were obtained for malaria and respiratory illnesses. Clearly, most growth indicators were removed from the adjusted models.

We concluded from this study that in the tool-box they are many tools to find the child in need, and that among these tools the information gained from the mothers is usually more relevant than biometry. The third study I would like to mention has been conducted in urban Burkina Faso (25). Detailed results of this study were presented during session five of this colloquium (26). The purpose of this study was to evaluate the effectiveness of a new model of child health care as compared with the standard one. In this view, more than 1000 newly registered under-fives were randomly allocated into two groups, and they were followed-up to the age of 12 months. The new model of care included integration of curative and preventive services, attention given to mothers' feeling, and autonomy in health-worker decision making.

In the intervention group, we observed that the health-worker was really more committed to the patient, agreed most often with the mother when rating the health status of the child, performed less formal screening, and took initiatives to adapt the package of activities to the current health status of the child. As a result of this renewed approach, we observed a better survival and a better height growth in the intervention arm of the trial. Table 2 displays the Cox model comparing survival of the children in the two groups. It appears that children in the intervention group had a better survival at each moment during the follow-up. The computed hazard ratio of death was 0.56, corresponding to a relative risk reduction of 44 %.

We concluded from this study that a renewed organization of child health care could have an impact on "hard" endpoints such as premature death or stunting.

Table 1: Kivu study. Factors related to odds of experiencing at least one episode of diarrhoea per one-month interval, for children aged < 9 mo and ≥ 9 mo. (From Tonglet et al. 1999 (21)).

Adjusted odds ratios from multiple logistic regression, which included the six anthropometric indicators of interest, age group, sex, time of enrolment into the study, judgement passed by the care-taker on the adequacy of the growth of the child at start of interval, child's diet at start of interval, and occurrence of the disease under scrutiny during the preceding interval. Wald test.

	Number	Number of 1-mo intervals	OR (95% CI) of episodes	р
<u>< 9 mo of age</u>				
Incremental height for a	ge (centile)		
< 25th	114	38	1.49 (0.94-2.05)	0.15
25th-49th	108	26	1.42 (0.86-1.97)	0.22
50th-74th	108	36	0.75 (0.18-1.31)	0.31
> 75th	117	31	1.00	
Child's diet				
breast feeding	185	63	1.00	
partial weaning	262	139	2.03 (1.62-2.44)	<0.00
Diarrhoea during the pre	eceding mo	nth		
yes	193	119	3.02 (2.62-3.42)	<0.00
no	254	83	1.00	
<u>≥ 9 mo of age</u>				
Age at start of interval (mo)			
9-14	384	184	1.00	
15-20	328	130	0.80 (0.49-1.11)	0.16
21-26	219	56	0.45 (0.07-0.84)	<0.00
Time of enrolment into	the study			
April 89	284	97	1.00	
July 89	222	82	0.96 (0.57-1.34)	0.83
October 89	217	102	1.58 (1.20-1.96)	0.02
January 90	203	89	1.29 (0.90-1.69)	0.20
Adequate growth as judg	ged by the o	care-taker		
yes	736	267	1.00	
no	194	102	1.56 (1.22-1.90)	0.01
Incremental weight for a	age (centile)		
< 25th	238	103	1.50 (1.10-1.89)	0.04
25th-49th	227	96	1.61 (1.21-2.01)	0.02
50th-74th	237	97	1.49 (0.71-2.26)	0.05
> 75th	229	74	1.00	
Child's diet				
Partial weaning	609	282	1.92 (1.20-5.00)	<0.00
Complete weaning	322	88	1.00	
Diarrhoea during the pro	eceding mo	nth		
yes	414	213	1.65 (1.36-1.93)	<0.00
no	517	157	1.00	

Table 2:	Ouagadougou study. Cox proportional hazard model
	comparing children in the intervention group with
	those in the reference group. (From 25,26).

Variable	s			n	
	Group		А		Réf
	-		В		
	Birthplace		home	34	Réf
			medical centre	768	(1)
			other	321	(2)
	Death of a child	<5y	=> 2	70	Réf
			< 2	1053	
Observa	tions				
	Cases	1120			
	Events	36			
	Censored	1184 (96	6,8%)		

Variables	HR	95% CI	P (Wald)
Group	0,54	0,27-1,06	0,08
Birthplace (1)	0,28	0,08-0,91	0,03
Birthplace (2)	0,55	0,16-1,91	0,35
death of a child <5y	0,32	0,13-0,76	0,01

Accountability in child health care: please, ask the mother!

So what?

I think that empirical and theoretical evidence support the view that some things are wrong with routine growth monitoring and promotion. Many share a too simple faith in the effectiveness of what appears to be a ritual: "it works whatever the quality of the health system may be". Too often, the health-worker is the only person to deserve attention: "the HW knows better, the mother has to complain and to comply". As an almost universal practice, growth monitoring is a technology-driven activity: "the HW has no autonomy in decision-making, standard procedures are mandatory".

Therefore, what should we do?

Firstly, the lesson learned from the study by George is that GM is as good as the health care system is good. Thereby, reinforcement of primary health services should be placed on the very top of the agenda. The priority is to care for the child as a person, either healthy or sick. It is not to perform formal check-up or to manage a short list of childhood illnesses (27).

Secondly, the lesson learned from the Kivu is that caring for the child requires giving value to mothers' feeling. Health-workers should be encouraged to strength patient-centredness in place of offering technical solution without expecting anything more than compliance. The message directed to the health-workers should be: "Please, ask the mother".

Finally, the lesson learned from the trial in Ouagadougou is that we should recognize that the place of decision is within the patient-doctor relationship. In order to add value to growth monitoring and promotion, we should give value to health-workers' competencies.

The message could be: "Please, ask the health-worker about his opinion on the way to care for the child in charge, and let him participate to the decision".

These are my recommendations for discussion.

References

- 1. Anonymous. Growth monitoring: intermediate technology or expensive luxury? *Lancet.* 1985;**ii**:1337-38.
- 2. Gerein N. Is growth monitoring worthwhile? Health Pol Plann. 1988; 3:81-94.
- 3. Lofti M Growth monitoring: a brief literature review of current knowledge. *Food Nutr Bull*.1988;**10**:3-10.
- 4. Nabarro D, Chinnock P. Growth monitoring Inappropriate promotion of an appropriate technology. Soc Sci Med. 1988;26:941-8.
- 5. Henry F, Briend A, Cooper E. Targeting nutritional interventions: is there a role for growth monitoring? *Health Pol Plann.* 1989;**4**:295-300.
- 6. Van Lerberghe W. Growth, infection and mortality :is growth monitoring an efficient screening instrument? In: Tanner JM (Ed.): "Auxology 88. Perspectives in the science of growth and development". *London: Smith-Gordon*, 1989;101-10.
- Cervinskas J, Gerein N & George SM (Eds.): Growth promotion for child development. Proceedings of a colloquium held in Nyeri, Kenya, 12-13 May 1992. Ottawa: International Development Research Centre, 1993
- 8. Waterlow JC. Nutrition and growth. In: Waterlow JC: "Protein Energy Malnutrition". London: Edward Arnold, 1992;187-211.
- 9. Schroeder DG, Brown KH. Nutritional status as a predictor of child survical: summarizing the association and quantifying its global impact. *Bull World Health Organ.* 1994;**72**:569-79.
- Pelletier DL. The relationship between child anthropometry and mortality in developing countries: implications for policy, programmes and future research. J Nutr. 1994;124:2047S-2081S.
- 11. Dramaix M, Hennart P, Brasseur D et al. Serum albumin concentration, arm circumference, and oedema and subsequent risk of dying in children in central *Afr Br Med J*. 1993;**307**:710-13.
- 12. Dramaix M, Brasseur D, Donnen et al. Prognostic indices for mortality of hospitalized children in Central Africa. Am J Epidemiol. 1996;**143**:1235-1243.
- 13. Waterlow JC. Malnutrition and mortality. In: Waterlow JC: "Protein Energy Malnutrition". *London: Edward Arnold*, 1992;325-343.
- 14. Chen LC, Chowdhury A & Huffman SL. Anthropometric assessment of energyprotein malnutrition and subsequent risk of mortality among preschool aged children. *Am J Clin Nutr*.1980;**33**:1836-45.
- 15. Briend A, Wojtyniak B & Rowland MGM. Arm circumference and other factors in children at high risk of death in rural Bangladesh. *Lancet*. 1987;ii:725-27.

- Kasongo Project Team. Anthropometric assessment of young children's nutritional status as an indicator of subsequent risk of dying. *J Trop Pediatr.* 1983;29:69-75.
- Smedman L, Sterky G, Mellander L, Wall S. Anthropometry and subsequent mortality in groups of children aged 6-59 months in Guinea-Bissau. Am J Clin Nutr. 1987;46:369-73.
- Vella V, Tomkins A, Borghesi A, Migliori GB, Ndiku J, Adriko BC. Anthropometry and childhood mortality in Nothwest and Southwest Uganda. Am J Public Health. 1993;83:1616-18.
- 19. Hall DMB. Growth monitoring. Arch Dis Child. 2000;82:10-15.
- 20. Panpanich R, Garner P. Growth monitoring in children (Cochrane Review). In: The Cochrame Library, 4. *Oxford: Update Software*, 2001.
- George SM, Latham MC, Abel R, Ethirajan N, Frongillo EA. Evaluation of effectiveness of good growth monitoring in south indian villages. *Lancet.* 1993;**342**:348-51.
- 22. Tonglet R. Surveillance de la croissance et prévention de la morbidité du jeune enfant en milieu rural africain: éléments d'évaluation épidémiologique [PhD dissertation] Université Libre de Bruxelles, Faculté de Médecine, Bruxelles, 1994.
- Tonglet R, Mahangaiko Lembo E, Dramaix M, Hennart P Weakness of biological markers of nutritional and inflammatory status as prognostic indices for growth retardation and morbidity of young children in central Africa. *Eur J Clin Nutr.* 1997;**51**:148-53.
- 24. Tonglet R, Mahangaiko Lembo E, Mweze Zihindula P, Wodon A, Dramaix M, Hennart Ph. How useful are anthropometric, clinical and dietary measurements of nutritional status as predictors of morbidity of young children in central Africa? *Trop Med Int Health.* 1999;**4**:120-130.
- 25. Tonglet R, François I, Compaoré H, Daoudongar Djimrassengar H, Kima S, Grodos D, Kaboré E, Dramaix M, Hennart P Essai clinique contrôlé et randomisé de la prise en charge intégrée du jeune enfant dans un service de protection maternelle et infantile en milieu urbain au Burkina Faso. Congrès de l'ADELF, Lyon, 12-14 octobre 2000. *Rev Epidém et Santé Publ.* 2000;**48**:3S138-139.
- 26. Francois I, Tonglet R, Compaore H, Daoudongar Djimrassengar H, Kima S, Kabore E, Dramaix M, Hennart P A randomized trial for the evaluation of a new model of routine child health care in Ouagadougou, Burkina Faso: The effects of changing practices and attitudes of the health staff. In : "Promoting growth and development of under fives". International colloquium. *Antwerp, Prince Leopold Institute of tropical medicine*, 28-30 November 2001.
- 27. World Health Organization. Integrated management of the sick child. Bull World Health Organ. 1995;73:735-740.

IS GROWTH AND DEVELOPMENT MONITORING IN CHILDREN REALLY USEFUL?

David Hall¹

This paper considers the role of growth monitoring and of developmental screening from the UK perspective, explains why the emphasis has shifted to primary prevention and health promotion and outlines the mechanisms for delivery. While the policy decisions are probably related to the political climate and cultural views of each country, the principles that have emerged are probably universally relevant. The paper draws on earlier reviews in journals and books.

Growth monitoring

Most health professionals, both in industrialized nations and in the developing world, support the routine measurement of height, weight and head circumference. Nevertheless, there is still disagreement about the objectives, the benefits, the ages when measurements should be made and the threshold for intervention or referral. These questions have been examined in a series of working parties in the UK since 1986.

Interpretation of growth measurements requires skill and judgement, and is easier when several measurements are taken over a period of time. With the possible exception of single height measurements, weighing and measuring children cannot be regarded as screening and we prefer the term "growth monitoring" (GM). Both screening and monitoring can be harmful. It is important not to overlook children with growth disturbances or disorders, but equally it is unethical to identify problems for which no intervention resources exist. Inappropriate referrals generate parental anxiety and a substantial increase in specialist workload.

GM in developing nations generally focuses on weight rather than height measurement and is often directed primarily at the problems of malnutrition. Although its value seemed self-evident for many years, Gerein and Shanti Ghosh are among the distinguished authors who challenged the underlying assumptions several years ago. More recently, a systematic review found little evidence that GM has any significant impact on the health of children in the developing world. The reasons for this finding

¹ Professor of Community Paediatrics, University of Sheffield, UK

probably include: incomplete coverage - the families whose children might benefit most from growth monitoring are those with multiple social and economic problems, who have difficulty in making full use of preventive health care measures; inaccurate weighing, charting and interpretation; rushed or inaccurate counselling of parents, due to inadequate staff training; poverty - lack of money and/or social support enabling parents to implement the advice given; cultural resistance to particular dietary recommendations.

Steady weight gain is a sign of good health, but the interpretation of growth charts is difficult. Babies do not all gain weight along the lines shown on the centile charts. Weight gain patterns vary in the first year of life, and this must be understood in order to avoid mistaken diagnoses of failure to thrive. The phenomenon of regression to the mean states that on average small babies (below the 50th centile at birth) will catch up (i.e. their growth line will get closer to the 50th centile), while big babies will catch down. Using the UK 1990 9-centile charts which have been widely accepted both for population and for clinical use, in which one centile channel is equal to 0.67 or two thirds of a standard deviation, experience shows that one baby in 20 will cross 2 centile channels.

These channel-crossing babies may have a disease or may be under-nourished – or it is possible that there are other factors that explain these observations. Wright found that a simple health visitor (community nurse) intervention would facilitate weight gain; but Rudolf and Raynor had less success. They did however document the extraordinary range of parent behaviour at meal times.

We have concluded that weighing babies can be beneficial if it part of an intelligent responsive approach to supportive health care for families, but is wasteful and probably harmful if the staff involved are not well trained – not only in the mathematics of charts but in nutrition, feeding, infant behaviour and family relationships.

In the UK, we have found no evidence to support routine monitoring of length, though of course this is a part of routine clinical practice whenever one is concerned about a child and is also part of clinical assessment when a child presents with a problem.

Similarly, gain in height is a valuable marker of health, but monitoring height over time is fraught with difficulties. Inaccuracies in equipment and in plotting on the chart, variations in measuring technique, true short and long term variability in growth rates and the effects of short term illness all contribute to the difficulty of identifying the child with genuinely abnormal growth. While the debate continues, our current view is that a single height measurement at five will detect most children meeting 2 criteria relevant to screening – asymptomatic except for short stature, and likely to benefit from treatment. The conditions that meet these criteria are isolated growth hormone deficiency and Turner's syndrome. We doubt whether growth monitoring is likely on its own to detect psychosocial short stature and it is unlikely to be the best way of achieving this goal. However, it is true that measurements taken in the past may be useful when trying to assess current status.

In industrialized nations, we have anxieties about poor weight gain, due to under-nutrition or psychosocial deprivation, in the first year of life, but these are followed in mid-childhood by increasing concerns about the emerging epidemic of obesity. Our intention is to monitor Body Mass Index – but as a public health marker rather than for use in clinical care. While under-nutrition is the wellrecognized threat in the developing world, obesity is fast becoming a bigger problem even in poor nations.

Development

There is good evidence that most children with serious disabling and handicapping conditions are detected by a range of means, but screening makes little contribution. In the developing world, the situation may be different, in that conditions like mental handicap (learning disability), deafness or autism may not be differentiated or even recognized as being abnormal. However, in most settings, one of the fundamental criteria of the original Wilson and Jungner analysis of screening is not met – namely, the crucial importance of a clinical service that can meet the needs of the children who would be detected by screening.

Screening might be more useful in finding children with mild or borderline delays in learning, language or motor development. The literature suggests that it performs poorly in this task. Many children are missed and this is not surprising because the early rate of development is not a very powerful predictor of later IQ. Those children who fail a screen but pass detailed assessment may have a worse outcome than those who pass the screen. This also is not surprising, because developmental abilities are a continuum – there is no clear division between "normal" and "slow" children's intelligence.

We have not totally rejected the need for developmental screening but we judge that the tide of evidence runs against it and we doubt if it is the best way to use resources. Parents value the chance to take stock of their child's progress with the help of a trained professional and when there is doubt or uncertainty a developmental test may be useful – but the starting point is negotiation and mutual agreement as to what the issues are.

Primary prevention

Whereas there is little reason to be enthusiastic about screening, there is more reason for optimism in prevention. Leaving aside the attack on poverty, there is good evidence that certain styles of parent –professional interaction are more effective than others; that language development and literacy can be accelerated; that parents can change their children's behaviour; and that communities are important as well as individuals. These insights combine in the UK Government programme – "SureStart".

Conclusion

Growth monitoring is of uncertain value. It is important to ensure that it does no harm; that its assumptions and objectives are explicit; that those objectives are relevant to the problems of that particular society; and that there is no better way to address those problems.

Developmental screening is probably less useful than the promotion of child development. The evidence supports current initiatives to change children's life course.

References

This material is derived from the draft 4th edition of "Health for all children". This will be available (together with references to the authors quoted) on:

www.health-for-all-children.co.uk

Pending publication in April or May 2002.

Previous editions:

Hall, D (editor). Health for all children. Oxford: OUP. 1st edition 1989; 2nd edition 1992; 3rd edition 1996.

UNDER-FIVES' CLINIC : AN OBLIGATION TO CHANGE THE PARADIGM

Paul Bossyns¹

Introduction

In Niger, as in most other African countries, twice a week at least, all health centres of the nation spend the essence of their daily duty in the under-fives' clinic. During these clinics, at least 70 % of the time is consumed by the act of weighing children. If one spends so much time (20 %) on one single act, it must be really worthwhile.

But where is the evidence?

In a poor country like Niger, where famine is a real risk and food production shows a deficit nation-wide every year, health centres diagnose severe malnutrition for 0 to 6 % of all children. Virtually none of these children are referred to a hospital environment for treatment. In one survey it was noted that congenital malformation was more frequently referred from the health centres to the district hospitals than children suffering from malnutrition. Among the few children that are followed up more intensively at the health centre level for malnutrition, half the mothers 'abandon' treatment before cure. Clearly credibility is at stake. Moreover, if we can believe the national health information system, the mortality rate for malnutrition is virtually zero, childhood tuberculosis non-existent...

If this is the best performance possible in the field, why would we continue?

The above brief description of field reality is not at all exceptional for sub-Saharan Africa. This paper will try in a first part to analyze why performance of the under fives' clinic is so poor. In a second part we will try to build up a concept that might give an alternative view on the problem of malnutrition and a renewed search for appropriate answers.

¹ Geselschaft für Technische Zusammenarbeit, Niger

Why is performance so low?

Problems of identification

Often, the identification of malnutrition constitutes a major issue for nutritionists. All kinds of scales and norms are being applied. Though not exempted from criticism as well (1), the most accurate and objective means to identify malnutrition for the moment is probably the weight for length measure, indicating the number of standard deviations a child is deviating from the norm. Niger has introduced this approach already some years ago under the watchword "The more precise the identification, the better the programme".

From an operational point of view, the solution became one of the major problems. Weighing a child is one thing, taking its length another. Measuring the height of a child is time consuming, reason enough for health staff with limited motivation not to do it (correctly). Moreover, most children, -and their mothers-, do not like it because they feel they are being taken prisoner when the mother holds the head and the health worker the legs. Because the method is time consuming, Niger has adapted the policy to measuring the length only for children with the weight under the third percentile. This obliges health staff to fill in a weight – age curve as well, which makes the method even more time consuming, and declares by definition all children above the third percentile not to suffer from malnutrition. This obviously leads to situations where visibly malnourished children are said to be normal, whereas naturally small children or children with stunting are measured every month and declared normal. The field translation of a very scientific approach makes the latter counter-productive.

The second inconvenience of this approach is the fact that the evolution of the child's weight is not being followed which leads to late diagnosis, and a much more complicated intervention. It likewise does not encourage the development of a continuous dialogue with the patient.

Thirdly, by creating under-fives' clinics, the weighing act has shifted from a sick population towards an a priori healthy population of children. In other words, the diagnosis of malnutrition has been separated from curative services, where the prevalence is much higher and motivation of the parents is more important as well because they have already recognized a problem. If we regard 'weighing' as a test applied to a certain population, we know that the prevalence of the problem largely determines sensitivity and specificity of the test, hence its usefulness.

Underlying reasons for malnutrition

Where is malnutrition coming from? What are the reasons underlying the diagnosis? The standard answer in textbooks, known by most health workers is represented by the vicious cycle of infection and nutritional status, aggravated by socio-economic factors, read poverty. But when it comes to the operational level, in a country such as Niger, malnutrition is reduced to a 'food problem only', an attitude which is reinforced by the fact that malnutrition is being diagnosed during a preventive clinic and hardly ever during curative service. Or, as some doctors in Niger declare: "No, this is not malnutrition, this is a pneumonia case". Or the staff at the health centre, when asked why they did not notice the malnutrition of the child who presented with bronchitis: "It is not that I didn't notice the malnutrition, but this is not the under-fives' clinic".

The evolution of weight gain over time is rarely actively used in diagnostic procedures of malnutrition because growth charts are rarely filled out properly and even more seldom interpreted, one of the major reasons being the widespread confusion still reigning in the field that children under the third percentile are malnourished and those above are not. Hence diagnosis is often late, causing health workers to run behind a difficult problem instead of avoiding one. The determinant events underlying malnutrition are often situated in the past well before the moment of diagnosis. What is the message one can still give to a mother with a malnourished child, who was suddenly weaned 6 months ago? What could have been a 'simple' advice at the moment the growth curve of the child started changing, has become a major problem.

Even if health workers would try to take into account biological factors determining the nutritional status of a child, the diagnosis is still reduced to a simple cause-effect logic. How to explain that during the drought year of 1991, when Zimbabwe massively distributed food, malnutrition was still 3 % of all children, exactly the figure of before the famine period? As a reaction to this observation, some local nutritionists demanded that still more important amounts of food should be distributed. There must be more to it. It looks as if Zimbabwean society is creating 3 % of children to be severely undernourished, whether the harvest was good or bad (we are excluding stunting). Malnutrition rates seem to be 'structural', or in other words, as long as we do not change the system, 3 % of children will remain malnourished. The question is, what system and what structure are we talking about? This will be tackled further on.

118

Advice and treatment that accuse but don't explain

False diagnosis must lead to incorrect solutions. The direct connection made between malnutrition and food and food taboos is resulting in standardized and oversimplified solutions. In Niger, malnourished children are inevitably referred to food demonstration sessions where mothers are educated in 'how to prepare a proper meal'. For women who have been assisting their mothers for years during their youth and maybe have been preparing for years meals for their husband and several other children, teaching them to cook must seem as if you tell them that they are not women or that they are mentally handicapped. Claiming implicitly that a mother is not giving enough food to her child is accusing her of wanting to kill it and puts her in a very difficult situation before her husband and his family who believe in witchcraft and people who eat the soul of others. No wonder that women do not inform their husbands on such a diagnosis and advice.

In Niger, health workers know very well that mothers often refuse to attend food demonstration gatherings because they (the mothers) consider it a public insult either of not knowing how to prepare meals or not giving enough food to the child, while the mother herself is in good health.

In Niger, tradition does not make the link between a marasmatic child, -which they describe in local language as the child suffering from the big head,- and lack of food or a feeding problem. We, modern health workers call this ignorance, instead of listening carefully and recognizing that "not eating well" might be a consequence of a deeper reason.

The fact that health staff are supposed to give food demonstrations reinforces again the simplistic relation made between food and malnutrition.

On the rare occasions that health staff in Niger advise mothers, they urge them to give more fish and meat with plenty of fruit and vegetables to the child. Not only is this advice scientifically doubtful because one should first consider calorie increase, but it is often not realistic from a financial or organizational point of view.

Culturally un-adapted programme

In most African countries and tribes, husbands are the owner of the child in a marriage. This is imbedded in a logic where the child represents an additional working force for the husband's clan, for which the man's clan compensated the woman's clan by the bride price and on which logic food production and distribution, divorce procedures and inheritance systems are built. This system is nearly the exact opposite from western culture which is traditionally based upon a common system with ancient India (until today in India, it is the wife's clan who pays the bride price).

Under-fives' clinics are conceived in an occidental culture. Mothers are being held responsible for the health and nutritional status of their child. But this is often not the case in an African context. The husband determines which food and in which amount he will take out of the storeroom, how much money he will and can make available for food. A woman who has to tell her husband that she has not been feeding her child well can get 2 answers from the husband. Either he will accuse her of having done something else with the food or the money he provided, or else he will interpret that she is accusing him of not taking his responsibility towards his children, the equivalent of a mother who does not prepare meals properly. In both instances women will be shouted at, a reason why they will only rarely talk in those terms to the husband.

Husbands are never invited to under-fives clinics to discuss the health of their child. Nevertheless, they have more power to intervene effectively. If the husband orders his wife to put more oil in the meal of his child or to prepare separate meals, she will execute his wishes as long as he provides her the means. Women want dare to take such an initiative independently. In case of malnutrition, as for any serious disease of a child, for which extra expenses (money or effort) are needed from the parents, the father of the child should be invited and explained the condition of his child. As long as the father is not actively involved, he will not take things seriously, because he is assuming he will be called for if something serious happens with his children, for the simple reason that he, and not his wife, is responsible for their health.

And the health staff?

Under-fives' clinics are generally held by nurses or midwifes at health centre level. They are facing several problems: the complexity of malnutrition and its causes, making standardized answers inadequate; no means to reduce poverty or to supply food; running behind the problem instead of early intervention; contradictory and/or unrealistic instructions. Results are minor, compared with a major effort demanded, which will further diminish their already low motivation. Dialogue between patient and health worker is scarce and fragmented, whereas a chronic condition demands continuous interaction and negotiation.

Health staff has been trained to think in biomedical and epidemiological models. Malnutrition is due to reduced food intake, sometimes aggravated by infectious or other disease, all related to poverty and ignorance (the epidemiological dimension). Because poverty and ignorance are not immediately vulnerable to change through the health service, health staff feels helpless and claims that malnutrition is a social, not a health problem.

Moreover, instructions to run the under-fives' clinic are often ambiguous and incomplete, meaning that all relevant situations are not covered or that they allow to classify the same condition under different categories (example: (2)).

In such an environment of poor diagnosis, poor dialogue and poor treatment, no wonder that results are poor as well.

Changing the paradigm: the malnourished child as a symptom of a family under stress

Malnutrition has been studied and treated mainly in a traditional biomedical model, identifying the problem as a vicious cycle between deficient food intake and (infectious) disease (Figure 1). Epidemiologists have added the socio-economic factor : poverty, illiteracy, ignorance in general (Figure 2). This approach allows malnutrition to be described as a complex problem of risk factors (3). But the bio-medical as well as the epidemiological model fail to respond to the question : "Why is this child malnourished, and not the neighbour's child?" Curiously among 60 to 90 percent of children in Niger, living below the absolute poverty barrier, only 3 to 6 percent are moderately to severely malnourished (stunting excluded). How can we explain this? What is the difference between these children?

Figure 1: The biomedical paradigm of malnutrition



Figure 2: The biomedical and epidemiological model of malnutrition



121

Modern medicine and medical psychology and anthropology recognize that other dimensions determine illness and disease patterns. Disease is also determined by psycho-social and anthropological factors that make the diagnosis much more specific and individual. Only at this level, can malnutrition be understood in all its dimensions.

A systems approach in psycho-therapy and family care in Western countries describes how the sick child (mentally or physically) represents the major symptom of a sick family, rather than being the source of ill health. The child does not eat well, cries all night, makes a suicide attempt in an attempt to prevent his or her parents from divorcing. The fracture in the case of a battered child syndrome is the symptom of a family under stress. Obesity in Western children often is a symptom of (emotional) child neglect.

Family therapy as applied in the Western world takes the patient only as the symptom carrier of a sick family, especially if we talk about a 'sick' child. When parents cannot solve their personal problems between them, the family finds itself in an imbalance of complex power and affinity relations. The child generally places him or herself in between the two parents as some kind of buffer, but because he or she cannot cope with this stress which goes far beyond children's capacity, the child de-compensates and becomes ill, in other words starts to show symptoms. In system therapy, the child is regarded as a victim of the situation and therapy concentrates purely on the real relation problems of more powerful members in the family system (the parents). When therapy can change the situation of the parents, the child's symptoms disappear spontaneously.

How could this be translated into third world situations? In an informal observation of hospitalized children with malnutrition in Zimbabwe in the early nineties, it was estimated that 50 % of cases were HIV related. All these mothers were initially 'accused' of not taking care well of their baby, while they were actually involved in a dramatic and hopeless fight to prevent their child from dying. Another 20 to 30 % were related to divorce and early weaning The remaining 20 to 30 % were more diverse in 'diagnosis': depression or retardation of the mother, domestic violence and child neglect, epilepsy of the mother, alcoholism, social rejection of the family, deceased mother etc. Nearly all were situated in the psycho-social corner.

The list can be as long as the number of cases of malnutrition because at this level of analysis, every case represents a particular, unique story. But what becomes clear, lack of food is not a major issue and demonstration kitchens or discussions on food taboos are only occasionally the most appropriate answers to the problems encountered. Already in 1960, Farmer (4) described the importance of social and psychological stress situations in children with Kwashiorkor. Goodall (5) established the relation between Kwashiorkor and emotional disorders and the higher incidence of abrupt weaning and separation from the mother. Bouville (6) observed that malnourished children in Cameroon lived in a more unstable and less affectionate environment than healthy children. Deep cultural roots at the base of child mortality and hidden infanticide by refusing to feed the child are described in Ghana and elsewhere in Africa (7).

If we can agree that malnutrition is a complex phenomenon embedded in a complex family system, it is obvious that the treatment of malnutrition demands a comprehensive approach. Comprehensive or global care, or still "whole patient care" entails a shift from a purely biomedical and/or epidemiological model towards a model that includes psycho-social and anthropological diagnosis and intervention (Figure 3).



Figure 3: Global care diagnosis of malnutrition

In third world countries, due to the particular development of a modern medical system where first line doctors with their specific mission of global care are largely lacking, global care is virtually absent and unknown among health workers. Not surprisingly, those aspects of a health care system that most need this global approach are also those with the poorest performance: care for chronic illness such as tuberculosis, AIDS, psychiatric disorders, epilepsy, care for handicapped people, and of course malnutrition.

In a third world situation, children in families under stress quickly become malnourished. The already precarious environment does not tolerate any inattention towards the child's development. Whenever the child gets into a situation of less attention such as child neglect, depressed mother, new baby or pregnancy in the family, threatening divorce of the parents with domestic fights, etc, (often already imminent) malnutrition will become apparent. It is only through this very individualized diagnosis and recognition of the situation that specific interaction with the parents becomes possible and the health worker will be able to build enough confidence for his (feeding) advice to be acceptable.

Two case studies at the end of this article, derived from personal field experience, illustrate the concepts that have been developed so far. They will serve as well as examples of how a comprehensive approach can lead to new dynamic solutions of the problems surrounding malnutrition. The examples present complex situations, simultaneously illustrating several aspects of the comprehensive approach proposed in the paper. In her article, Goodfriend (8) describes the importance of 'psychosocial paediatrics' in developing countries with similar but less complex case studies.

How to operationalize a comprehensive approach for malnutrition

Long term solutions

Obviously, long term solutions can be obtained only through a profound change in training of medical and para-medical personnel, with more emphasis on a holistic type of care in opposition to the classical bio-medical approach, with its narrow view on disease and illness. This demands a profound up-grading of general medicine in third world countries where first line global care is recognized only in a very limited way and most doctors wish to become specialists as soon as possible.

Immediate and mid-term solutions

Changing attitudes and routine approaches towards cure and care is not an obvious task. Global care is a typically western approach of care which gradually developed during the after-war period in balance with the changing claims made by society. These forces did not exist in third world countries, which explains that no spontaneous evolution to a more comprehensive care medicine took place. Global care in modern medicine is largely exogenous in nonwestern societies.

Probably the most important tool to convince health workers at any level of the importance of global care, especially for chronic

and complex conditions such as malnutrition, is by giving the example. "Living the example" is a very powerful educational tool. It is too much put aside though in actual development aid because the difference between giving an example is easily confounded with what we call 'substitution', replacing what somebody else is capable of doing himself. Of course this means also that medical doctors with the specific skills are available to give this 'demonstration'.

It is difficult on purely theoretical grounds to change basic attitudes of health personnel. Field experience is a radical way of convincing health workers of a need for change. How this would fit in modern development aid strategies where expatriate public health doctors are giving advice to ministers and secretary generals and where Sector Wide Approaches focus on solving the problems with global financial aid, remains an open question.

In my experience 'giving the example' does not suffice though, no matter how useful. It can only be the initial 'click' which makes people aware of interesting new dimensions in health care delivery. Explicit knowledge of underlying reasons for malnutrition in the psycho-social and anthropological sphere and the degree to which those factors are vulnerable to change are equally important (see Table 1). Care for malnourished children should be delivered by general practitioners with a global care approach, rather than by nutritionists or other specialists.

Table 1:	Та	ble	1:
----------	----	-----	----

Reasons for malnutrition in the psycho- social and anthropological sphere		Are	eas of action possible		
►	Early weaning due to divorce	1	Involvement of the husband		
۶	Early and sudden separation from the	۶	Supporting the therapy		
	pregnancy	≻	Family planning		
۶	Mother with serious psychological or psychiatric problems such as	٨	Treatment of mental or physical illness		
	depression, mental retardation, epilepsy, divorce, psychosis, etc.	۶	Effective integration of preventive and curative services		
\succ	Child neglect; battered child syndrome	≻	Gradual diagnosis through		
\triangleright	Alcoholism; domestic violence		continuous dialogue		
\triangleright	Chronic disease of the mother: AIDS,	≻	Formulation of unambiguous		
	tuberculosis, etc.		operational instructions to follow		
\succ	> Severe stress due to polygamy, fertility		the weight evolution and to allow		
	problems, etc.		a continuous dialogue		

Re-organization of health services and operational instructions can facilitate global care attitudes as well:

Integration of preventive (under-fives' clinic) and curative services

Weighing children is a diagnostic act. It determines not only a degree of malnutrition but it also reflects to a certain extent the prognosis of a sick child. Weighing children is related to curative care in the first place. The poor integration of health care services and the fact that under-fives' clinics have become a preventive programme among others has disrupted the relation between curative services and the weighing act. Instead of weighing the sick child as a priority act, it has become an additional need of integration of care, after weighing a priori healthy children. Weighing sick children is regarded as an extra burden to the health service. This distortion has probably grown from the positive bias towards preventive care at primary care level which has caused in the eighties and nineties a disproportionate discredit of curative care.

Instructions to change this situation are not difficult to introduce at health centre and even at district hospital level. Every sick child should be weighed and his weight evolution should be taken in account in diagnosis and treatment. When working with medical students in Niger, who hardly know about the existence of growth charts and have a maximum of ten hours course on malnutrition during the whole curriculum, the fact that the interpretation of the weight chart could influence diagnosis and medical decision was completely new to them. One of them reported that he was very proud of having been able to apply it in practice. It was for the first time he noticed the apparent contradiction of his overweight aunt with a malnourished child and who was ashamed to attend the 'feeding clinic', because "how could they (the health staff) tell that she was not feeding her baby well?" He filled out the child's growth curve because several weights were written down on its vaccination card and discovered it was a problem which could have been identified some months before already.

Early and gradual diagnosis of malnutrition, allowing a continuous dialogue

If one maintains preventive weighing clinics, the purpose of these clinics cannot be in the first place to identify severe malnutrition. In severe malnutrition, prevention has already failed and the likelihood that simple measures will have a positive impact is small. In preventive baby weighing clinics, developing a continuous dialogue about essentially trivial problems is more important than big therapies for severely malnourished children. Early deterioration of the nutritional status of a child cannot be detected through the approach of weight to length follow-up, but through simple interpretation of stagnating or diminishing weight over time. Though less scientific, simple instructions that favour dialogue on the health status and development of the child are more important than sophisticated interpretations of weight and height. In other words, diminishing efforts at the biomedical and nutritional diagnosis level might favour dialogue and a more global care approach.

Table 2 summarizes the proposed reorganization of the services and identifies the priorities for different activities. Weighing children is only useful when it either reinforces diagnosis and treatment, or when it refines the quality of the dialogue with the mothers.

Service – Activity	Content – Importance
FIRST PRIORITY: Weighing the sick child during curative clinics (weight-to-length as long as weight evolution is not being followed)	Refining diagnosis Identifying reasons for referral Refining the therapy
SECOND PRIORITY: Introducing preventive 'Well-baby' clinic	Establishing a dialogue on the health and development of the child with the mother Vaccination Vit. A distribution where appropriate Immediate referral to curative services in case of problems detected Involving the father in the dialogue
THIRD PRIORITY: Adding weighing sessions during 'well- baby' clinics and establishing weight to age curves (weight-for-age is less time consuming and can better reinforce a continuous dialogue than weight-to-length)	Weighing is to reinforce the dialogue, not a priority in itself Following weight evolution allows early identification of changes During first year of life: weighing at birth and according to vaccination calendar (5 X per year), the second year every 2 months suffices More intensive follow-up in case of
	health problems

Table 2:

Table 3 gives an example of 'easy-to-apply' and unambiguous operational instructions for weight evolution interpretations. The stages of malnutrition are 'operational' definitions that do not necessarily correspond to precise scientific categories. In field situations, instructions regarding the identification of malnutrition are often ambiguous: either classifications are not mutually exclusive or they do not cover all situations one can meet in the field.

Table 3: Operational instructions

Situation 1: The child gains weight normally	Situation 2: The child has not gained weight for 1 or two months
NO MALNUTRITION	DANGER OF INCIPIENT MALNUTRITION
To do:	To do:
Congratulate the mother Ask whether the child has any health problems Ask whether the mother is in need of family planning Administer Vit. A every 6 months Vaccinate when indicated	Reassure the mother Evaluate together with the mother if there are any health or weaning problems Propose at least 4 daily meals for the child with an increase in calories Insist on the importance of the next visit Propose family planning Vit. A and or vaccination if indicated
Situation 3: The child has not gained weight for 3 to 6 months OR	Situation 4: The child has not gained weight for more than 6 months OR
The child has been losing weight but less than 700 g compared with max. 2 months are	The child has been losing weight for 2 consecutive months (or more)
MODERATE MALNUTRITION	SEVERE MALNUTRITION
To do:	To do:
Follow instructions as under situation 2	Follow instructions as under situation 3
Examine the child and try to exclude physical illness Evaluate feeding practices Treat and give advice accordingly	Refer immediately if no definite diagnosis can be made or a promising solution proposed
Involve the father of the child if considered appropriate by the mother Intensify the follow-up visits in accordance with the mother	If not referred, intensify the follow-up visits weekly or according to the necessity of the underlying disease detected

Instructions on when and how to invite fathers in the process of care

At least for sub-Saharan Africa, fathers should be involved in the diagnosis and treatment of their children. They have in general more social, financial and general decision power than their spouses. They feel generally honoured when invited to talk about the health of their family because they feel recognized in the responsibility they are carrying. In the same way it took public health specialists nearly twenty years to discover that husbands should be involved in family planning at every stage, field experience shows more and more that the involvement of the father in decisions on the health of their children is extremely important. For every case of moderate and severe malnutrition, the father should be invited to clarify the dangerous situation to which the child is exposed. In his absence or when the husband constitutes an important obstacle to the child's health, uncles are often strong allies as they are important members of the therapy managing group. Much more than in Western societies, the therapy managing group is a powerful instrument to tackle complex health problems.

Amid all the new instructions proposed here, the preponderantly male nurses in Niger were most sensitive to the latter. They understand in a very natural way that it is against their culture if one does not talk to the father when a child is very ill. They recognize the particular decision taking power of the father and they assume that involving the father is culturally very acceptable.

Conclusion

Under-fives' clinics as they are generally conducted in Sub-Saharan Africa at the moment, are in crisis. They do not reach the objective of efficiently identifying and taking care of children with malnutrition, even less so for preventing it.

The underlying reasons are multiple and complex. They are situated at the level of diagnosis, treatment and follow-up, as well as at the operational level. Small adjustments in the operational instructions of health centre staff, increased supervisory visits or quality circles won't be able to counter poor performance. Without major changes, the effort and time investment at the diagnosis and treatment centres are not worthwhile. There is need for a radical change of paradigm on how malnutrition and its causes are explained and taken care of.

This article is based on non-systemized observation and individual case studies, combined with knowledge of other scientific disciplines than nutrition and bio-medical medicine. The critical reader will argue correctly that a lot of the hypotheses need confirmation and refinement. This text is indeed written to encourage researchers to take new directions in the investigation of the malnutrition problem at the individual patient level of a health centre or hospital. Two major problems need to be answered.

In the first place, malnutrition, as an individual health problem, should be re-investigated in the frame of the 'global care approach', taking in account psycho-social and anthropological aspects of illness. Malnourished children should be systematically examined for physical illness, for the family position in society and for the family structure in which the child is growing. These families could be compared with families without malnutrition. For this matter, medical doctors should look for close collaboration with anthropologists and psychologists (psychiatrists) with family therapy specialization.

Secondly, and from the operational point of view probably more difficult, would be the testing of new 'diagnostic' and 'therapeutic' procedures that are concentrating on the evolution of growth, prevention of malnutrition by early intervention and a continuous dialogue between elders and health workers. Unambiguous and realistic (applicable in the field) operational instructions need to be formulated and additional training for a constructive dialogue to be offered to first line health workers. This 'new package' should than be applied (correctly) and monitored for a long enough period in order to proof any impact on the nutrition status of these children and their long term survival.

In the meanwhile, local initiatives are useful and even obligatory in order to create a more realistic and culturally adapted programme through reinforcing the dialogue between health staff and patients, involving fathers in diagnosis and treatment, avoiding any form of accusation, and by integrating the weighing act into the curative services. Others have suggested community involvement and contracting out as important initiatives to be taken (9).

At the same time, medical practitioners (generalists) and other care givers of the first line should be trained in global care approaches and techniques that enable them to understand and manipulate psycho-social and anthropological aspects of illness. This would not only be useful for the malnutrition problem, but would increase the quality of care and cure in general.

Case study 1

A young father was presenting his malnourished child at the district hospital. This was a rather particular event, fathers usually do not accompany their children to hospital. When asked where the mother was, he answered that she had run away and that she left the child behind.

The next day, the nurses informed the doctor that this was the second time that the child was admitted with malnutrition but that on the first occasion the mother was present. The hospital insisted that the father would search for the mother, because he was not capable of looking after the child properly. It was only then that the man admitted not to be the real father but rather a half brother of the child. He was the only son of his father's first wife. He confirmed that they knew where the mother was, but that the mother was not allowed near to the child by her husband because she had abandoned the child and she was lazy anyway. After insisting for some days, the mother presented at the hospital. The mother indeed did not show much interest for the child and all questions were answered with very little enthusiasm and did not lead to any clarification of the obvious conflict situation. The provisional diagnosis was between borderline mental retardation or depression of the mother.

Because no meaningful information could be obtained from the mother, further exploratory conversations were held with the half brother. The doctor tried to explain him that maybe the mother was not lazy but depressed. A few days later, the young man explained that the child was not really his father's, because his father had been treated for fertility problems by the traditional healer. After the necessary ceremonies, a brother of the father was brought into the hut of the woman to make her pregnant. She delivered the child in the name of her husband. This is a well known practice in many African societies. The husband was described as a chronic alcoholic who visited prostitutes on a daily basis. The nurses confirmed this part of the story.

When the doctor confronted the mother with this story, she confirmed more or less and only another week later, the story finally became more clear.

When the woman was about sixteen years old, she was approached by her future husband. She always denied his advances, (she was much younger, and he had already a first wife), but this was difficult because she was from a very poor family, while the man was a storekeeper, hence relatively rich. Moreover, her family was in debt towards the man, because he buried several family members.

One day, he raped her. Not noticing menses, she got convinced after a while that she was pregnant and so she was obliged to marry the man. A few months later, she hat a spontaneous abortion (probably she had a psychological amennorhoea, which is a rather common syndrome in Zimbabwe).

In summary, she married her rapist, she got pregnant in his name and was treated badly because the husband was drinking heavily and she was only second wife. She had run away on a previous occasion with the child, but her parents had sent her back because they were still expecting the bride price the husband should pay them, after all these years. When the mother realized that the child was getting ill even when staying with the husband, she run away without the child.

After some more days, the husband and his first wife presented at the hospital. They described the second wife as very lazy and unreliable. He denied all alcohol abuse.

The couple was confronted with the fact that the child might not be his and that the mother was about to make an official complaint to the police for rape, which might cost him 8 years of prison. Even if he would not be convicted, the whole community would know what had happened. Although he denied all allegations, he agreed to divorce without claiming the child... This was the wish of the mother.

This case study shows clearly how the malnourished child was only the symptom carrier in a very sick family situation. There was no relationship between malnutrition and food availability. The child was used in a war between the two parents.

Luckily, not all cases have the same complexity. The example was given because it illustrates several aspects of the discussion in the paper.

Case study 2

The nurse in charge of one of the health centres contacted the hospital because neighbours came to see her complaining about a women who was beating her children and refusing to give them food. On the doctor's advise, she was referred to the hospital. She was admitted with two children below 3 years old. One of them was obviously malnourished.

It was only after a few days that she wanted to talk about her problems. Her husband was working in the capital. His first wife divorced a few weeks before. After the divorce, the husband took the three children (7, 3 and 1 year old) and placed them with his second wife. Now she was the first wife in the house, confronted with 6 children all below 7 years of age. In absence of the husband it was clear that she could not cope with the workload and that she had no emotional relation with the 3 stepchildren. Even in the ward, she was not cleaning the child when soiled, and she was feeding the child without commitment, while she was breastfeeding with love her own baby. The husband was called for. When he came and the situation was explained to him (in the meanwhile a second child was brought in malnourished) he wanted to take everybody home with the message that his wife would have to learn to cope with the situation. The doctor said that this was too dangerous because the wife was willing to take care with the head, but that her heart was refusing and that she was not guilty for that. A few days later the husband insisted to take everybody home anyway.

The local nurse was instructed to do a home visit after a few days to evaluate the situation. She phoned back to say that the three children of the first wife were back with their natural mother. The husband obviously had understood the situation and took a creative decision.

Discharging the child was a risk. But the husband got all the information in an organized way, which allowed him to understand the situation. The solution was entirely his'. It was important to wait for the husband and to leave the decision to him because he is ultimately responsible for the children.

References

- 1. Warner TJ. Reliability of indices of weight and height in assessment of nutritional state in children. *The Lancet.* 2000;**356**:1703-4.
- 2. Briend A. ORSTOM (Ed.). Prévention et traitement de la malnutrition. Guide pratique. ORSTOM; Institut Français de Recherche Scientifique pour le Développement en Coopération ed. Quimper, 1985.
- 3. Immink DCM, Payongayong E. Risk analysis of poor health and growth failure of children in central highlands of Guatemala. *Soc Sci Med.* 1999;**48**:997-1009.
- 4. Farmer AP. Malnutrition as an ecological problem. *East Afr Med J.* 1960;**37**:399-404.
- Goodall J. Malnutrition and the family: deprivation in Kwashiorkor. Proc Nutr Soc. 1979;38:17-27.
- 6. Bouville JF. Aspects relationnels de la malnutrition infantile en milieu urbain Africain. *Cahiers Santé*. 1993;**3**:433-40.
- 7. Allotey P, Reidpath D. Establishing the causes of childhood mortality in Ghana: the 'spirit child'. *Soc Sci Med.* 2001;**52**:1007-12.
- Goodfriend M. The importance of psychosocial paediatrics in the developing world. Trop Doct. 1999;29:90-3.
- 9. Marek T, Diallo I, Ndiaye B, Rakotosalama J. Successful contracting of prevention services: fighting malnutrition in Senegal and Madagascar. *Health Pol Plan.* 1999;**14**(4):382-9.

COMPLEMENTARY FOODS IN DEVELOPING COUNTRIES: IMPORTANCE, REQUIRED CHARACTERISTICS, CONSTRAINTS AND POTENTIAL STRATEGIES FOR IMPROVEMENT

Serge Trèche¹

Introduction

In most contexts of developing countries, malnutrition and growth failure appear at the age of about 6 months and prevalence of stunting reaches a maximum before 24 months of age (1). This coincides with the weaning period, which is the time period when different kinds of foods are successively introduced to complement breastmilk.

In regard to the simultaneity of the apparition of protein energy malnutrition and of the introduction of complementary foods, it appears that there are probably strong relationships between malnutrition and complementary foods. They can be either directly related because inadequate complementary food intakes or nutritional value leads to insufficient energy or micronutrient absorption or indirectly related since the early introduction of complementary foods often reduces breastmilk intakes and can cause food borne diseases (i.e., diarrhoea, parasitic infections) (2) or reduce the micronutrient bio-availability of the whole diet.

Complementary foods can de defined as any liquid or solid nutrient-containing foods given to young children in addition to breastmilk (1). In most contexts of developing countries, the first complementary foods consist in special transitional foods like gruels generally prepared from blends of flours or from fermented cereal doughs. As total energy and nutrient intakes of infant is the sum of energy and nutrient intakes from breastmilk and from complementary foods, the adequacy of the characteristics of these special transitional foods to the nutritional requirements and physiological or anatomical constraints of infants appears to be one of the necessary conditions of sufficient dietary intake, therefore of normal growth.

¹ Unité de recherche 106 "Nutrition, Alimentation, Sociétés", Institut de Recherche pour le Développement, Montpellier, France

Factors affecting energy and nutrient intakes from complementary foods

The variability and low level of energy intakes from complementary foods can be illustrated by giving some results of 11 surveys (Trèche et al, unpublished) recently carried out in five African countries (Burkina Faso, Cameroon, Congo, Guinea and Senegal) on 4-to-23-month-old children (Table 1). One of the objectives of these surveys was to estimate the amounts of complementary foods, which are effectively consumed per meal in free-living conditions.

Countries	Age	Type of gruels	n	Amount co	nsumed
(setting)	(month)			g/meal	g/meal/Kg
Burkina Faso	4-23	Home made	34	98	13.0
(Rural area)					
	6-8	Locally processed	139	74	10.9
Burkina Faso		blend			
(Urban district)	6-8	Local infant flours	180	46	6.2
	6-23	Fermented millet	24	128	13.7
Cameroon		Fermented maize	60	99	12.7
(Urban district)	4-11	Imported infant	50	98	15.1
		flour			
		Fermented maize	252	141	20.6
Congo	6	Locally processed	73	135	19.0
(Urban district)		blend			
		Imported infant	64	109	15.4
		flour			
Guinea	6-11	Locally processed	108	135	15.5
(Urban district)		blend			
Senegal	6-35	Locally processed	203	95	10.6
(Urban dis-		blend			
tricts)					
Average					15.3

Table 1: Gruel intakes of infants and young children in free-
living conditions in five African countries.

n: number of observed meals

Source: Trèche et al, unpublished

The average amount of gruel consumed ranged from 46 to 141 g per meal corresponding to only about 6 to 21 g per meal and per kg of body weight with a general average of about 15 g per meal and per kg of body weight. This value is considerably lower, about half, than the generally recognized gastric capacity, which is about 30 g per kg of body weight (3). Therefore, young children do not consume the quantity of transitional foods that they could normally do. This leads to take a special interest in the determining factors of their

food intakes in order to understand their low level and important variability.

Amongst the determining factors of energy and nutrient intakes from complementary foods, one can distinguish between:

- Immediate factors;
- Underlying factors which can be categorized as food, caregiver and child dependent;
- Some more basic causes related to household and mother characteristics, to food availability and to child's characteristics (4,5).

Three immediate factors determine the level of the daily energy or nutrient intakes from complementary foods: the number of meals per day, the amount of complementary foods consumed at each meal and the energy or nutrient density of each meal. Thus, the total energy intake from complementary foods can be calculated using the following formula (5):

$$EI_d = \sum_{i=1}^n = Ca_i \times ED_i$$

with:

- EId = Daily energy intake (kcal/d) from complementary foods
- i = Rank of the meal
- *n* = Total number of meals
- Ca_i = Consumed amount (g) of the ith meal
- ED_i = Energy and nutrient density (kcal/g) of the ith meal

In developing countries, the number of meals per day generally does not exceed two or three and cannot be easily increased because of the heavy workload of mothers. Energy density mainly depends on the nature of foods and processes used for preparing meals. The amounts consumed per meal depend on numerous underlying factors.

These underlying factors and their relationships with other determining factors can be summarized on a conceptual framework of determinants of daily energy and nutrient intakes from complementary foods (Figure 1). Figure 1: Conceptual framework of determinants of daily energy and nutrient intakes from complementary foods (CF)



Amongst the underlying factors, a distinction can be made between those relative to the complementary foods, those relative to caregivers and those related to the child.

The complementary food characteristics likely to influence intakes mainly consists in consistency, other organoleptic characteristics such as flavour and aroma (6), and dry matter and nutrient content which directly determine energy and nutrient density of the gruel, but can also influence its appetibility (7). Particularly, the importance of energy density and consistency of gruels on gruel intakes have been demonstrated (8-10).

Caregivers' dependent factors can be subdivided into those, which determine the methods of preparing gruels and those corresponding to feeding habits. In addition to the daily feeding frequency, these include breast-feeding patterns, intervals between meals, meal duration and level of supervision and encouragement provided during meal consumption.

The third category of underlying factors corresponds to child aptitude for ingesting foods, which mainly includes gastric capacity and appetite.

Three kinds of basic causes can be considered: caregivers' education, beliefs and income, food availability and child's characteristics. The first one includes household characteristics (i.e., standard of living, purchasing power, size and structure of the household, ethnic origin of household members) and mother's characteristics (i.e., age, occupation, level of education, nutritional knowledge, technological know). The second one corresponds to food availability and depends on the agro-ecological context and, when foods are not produced by the mother, on the price of ingredients likely to be incorporated into the gruels. The third one corresponds to child's characteristics, both permanent like genetic factors or gender, and temporary like age, weight, nutritional and health status.

The relative significance of the various immediate and underlying factors in free-living conditions is still not well known and probably depends on the context (4,5).

Required characteristics

Taking into account their role and factors likely to determine their level of intakes, it is easy to define the main general required characteristics of complementary foods, particularly those of special transitional foods:
- They must not reduce breastmilk intake and, as far as possible, the bio-availability of micronutrients contained in breastmilk;
- They must be safe that is to say free of pathogens and toxic compounds;
- They must have an appropriate energy and nutrient contents with sufficient bio-availability;
- They have to be accessible and acceptable.

The necessary safety of complementary foods has been extensively emphasized (2) and begins to be well known. But their required nutritional characteristics and the conditions of their accessibility and acceptability are still often not well known and deserve to be reminded. *Characteristics relative to the nutritional value of special transitional foods*

The principle for calculating the desired average energy or nutrient density of complementary foods consists in calculating the amount of energy or nutrient needed from complementary foods by subtracting the amount of energy or nutrient consumed from breastmilk from total energy or nutrient requirements of the child (1). Then the desired average energy or nutrient density in complementary foods is obtained by dividing the amount energy or nutrients needed from complementary foods by the total amount of complementary foods which is daily consumed.

This calculation is the first step of the estimation of the minimum energy density required for complementary foods (Table 2).

Table 2: Estimation of the minimum energy density of complementary foods (kcal/100g)

Class of age	Requirement (kcal/d)		Energy in- take from breastmilk (kcal/d)	Energy that a child must be able to	Gastric capa- city ³	Minimum energy den- sity depending on the number of meals per day		
		+2SD	(, ,	consume	(ml)	2	3	4
	Aver			from CF		m/d	m/d	m/d
	age ¹			(kcal/d)				
6-8	682	852	Low ² : 217	635	249	128	85	64
month			Average: 413	439		88	59	44
9-11	830	1037	Low ² : 157	880	285	155	103	77
month			Average: 379	658		116	77	58
12-23	1092	1365	Low ² : 90	1275	345	185	123	92
month			Average: 346	1019		148	98	74

¹ From Butte (11) and Torun et al (12)

² Mean-2SD of energy intakes observed in developing countries

³ Taking into account an average gastric capacity of 30 ml per kg of body weigh

For each class of age, after estimating a safe level of energy requirement by adding two standard deviations to the average requirement of children, the estimated energy of breastmilk is subtracted taking into consideration average or low level of breastmilk intakes to obtain the energy that a child must be able to consume from complementary foods. After taking into account gastric capacity, it is possible to calculate the minimum energy density corresponding to different feeding frequencies. If children consume two meals per day, which is the most prevalent feeding frequency in developing countries, a minimum energy density of 128 kcal per 100 g is necessary to allow most children between 6 and 9 months of age to meet their energy requirement. This energy density is also sufficient to meet the energy requirements of older

140

children with three meals per day and low breastmilk intakes. Thus, an energy density of about 120 kcal per 100 g can be considered as a reasonable value for most children less than 2 year old.

The same calculation can be used to estimate the desired mineral and vitamin density of complementary foods by class of age and by level of breastmilk intake taking into account different levels of bio-availability (1). The desired values are generally expressed per 100 kcal. Thus, if the complementary foods have micronutrient contents at least equal to these values, the corresponding mineral or vitamin requirements will be met if children consumed sufficient amounts of complementary foods to meet their energy requirement.

But micronutrients must not only be available but also bioavailable that is to say effectively absorbed and metabolized (13, 14). Bio-availability depends on:

- The chemical nature of nutrients;
- The physicochemical environment of molecules;
- The technological processes applied;
- The ability of the digestive tract of young children to adapt to different nutritional and physiopathological situations;
- The absence of anti-nutritional factors.

The most frequently encountered anti-nutritional factors are phytates which limit the bio-availability of protein, phosphorus and, above all, bivalent cations (e.g., Iron, Zinc and Calcium), enzyme inhibitors like antitrypsic factor which reduces the hydrolysis of proteins, polyphenols or tannins which can reduce protein digestibility and mineral bio-availability, lectins which can decrease digestive capacity and absorption and cause gastro-intestinal disorders and alpha-galactosides which cause flatulence and diarrhoea. Appropriate technological processes, mainly biological or thermic, must be used during complementary food preparation in order to reduce the activities of these anti-nutritional factors (14, 15).

Accessibility and acceptability

Concerning accessibility and acceptability; required characteristics depend on whether complementary foods are bought or homemade by caregivers.

For commercial products, in order to effectively contribute to child feeding, complementary foods and particularly special transitional foods, have to:

- Be available close to households with young children;
- Be cheap because of the low purchase power of most households;

- Be free of ingredients corresponding to food taboos;
- Be easy to prepare because of the heavy workload of mothers which often limits the time devoted to preparation and distribution of meals;
- Have organoleptic characteristics corresponding to local food preferences.

For homemade complementary foods, there are two main conditions: appropriate ingredients must be available and caregivers must have time and sufficient technological and nutritional knowledge.

Present situation of food products used as special transitional foods in developing countries

Commercialized food products usually used as special transitional foods in developing countries are mainly fermented products and infant flours.

Fermented products

These products which are commonly used for preparing gruels in African countries have numerous advantages because lactic fermentation induces favourable modification of nutrient composition, improves protein digestibility, reduces activity of some antinutritional factors such as phytates, tannins, and agalactosides, inhibits pathogen growth and toxin production and confers to final products appreciated organoleptic characteristics in general (16).

But they present also risks and disadvantages linked to the fact that:

- Traditional fermentation induces insufficient reduction of viscosity which does not allow the preparation of gruels having both appropriate energy density and consistency;
- Fermented gruels have generally insufficient essential nutrient density because they are generally prepared from only cereal and sugar;
- The amount of the D form of lactic acid produced can result in acidosis;
- Some pathogenic organisms, food borne viruses, mycotoxins and bacterial toxins can be resistant to the environmental changes induced by fermentation.

Commercial infant flours

These products found on the market in developing countries are likely to present several flaws. Their hygienic quality depends on the quality of raw materials and hygienic practices during processing. Their energy density is generally insufficient unless gruels are prepared using appropriate processes or when sources of amylases are added. Their nutrient content is generally insufficient for lipids and minerals and vitamins unless supplements are incorporated. Last, but not least, their price is out of reach of the majority of households.

The insufficiency of energy density of gruels prepared from most of the commercial flours locally produced in developing countries has been illustrated (17) by calculating the energy density of gruels prepared from different kinds of flours at concentrations corresponding to acceptable viscosity for infants. Amongst gruels prepared from 21 blends produced in small-scale production units only one from Gabon in which amylases were incorporated allowed to prepare gruels with both a sufficient energy density and an appropriate consistency. The situation was the same for infant flours locally produced in semi-industrialized production units as only 1 out of 11 blends, produced by extrusion cooking in Senegal, presented the required energy density and consistency. The situation was better, but still insufficient, for blends produced and commercialized in developing countries by the international Thus, energy density of gruels prepared industry. from commercialized infant flours produced in numerous developing countries appears to be insufficient except for the few flours produced following appropriate technological processes.

The determination of nutrient contents of infant flours locally produced in Africa and which were randomly collected in various African countries (Table 3) show that, with the exception of protein, nutrient contents are generally inferior to the required nutrient or micronutrient contents for most of the analyzed infant flours (18).

Potential technological ways to improve complementary foods

Improvements are needed at different levels: hygienic quality, energy density, nutrient balance and nutrient bio-availability. Improving energy density of gruel is of particular importance because, if its nutrient/energy ratio is well balanced, its nutrient density is improved at the same time.

Country	Flour name	Protein (g/100g DM)	Lipids (g/100g DM)	Calcium (mg/ 100 gDM)	Iron (mg/ 100g DM)
Benin	Ouando 2nd age	22.5	6.4	102	9.4
Burkina Faso	Misola	16.2	11.4	96	5.2
	Vitaline	12.7	9.5	128	6.7
Burundi	Musalac	15.0	8.6	79	12.9
Chad	Vitafort	11 to 15	4.6 to 7.8	20 to 28	2.3 à 7.0
Congo	Harina forte	12.1	6.8	325	8.6
Côte d'Ivoire	Farinor	15.8	6.8	324	24.0
Gabon	Nourivit	9.8	5.7	492	4.9
Guinea	Yéolac	14.8	8.1	96	10.8
Niger	Bitamin	15.7	9.4	43	6.6
RD Congo	Cérévap	15.4	6.5	369	7.3
Rwanda	Sosoma	17.8	3.8	500	18.1
Senegal	Ruy Xalel	8.0	5.2	39	5.1
	Provital	9.6	7.4	41	1.9
Togo	Viten 2nd age	15.5	7.6	100	10.9
Minimal recom	mended value	12,0	8.5	500	16.0
Determination on randomly collected flours in market Source: Trèche (18)					

Table 3: Nutrient content of some infant flours from localproduction units in Africa

The best way to improve hygienic quality seems by popularizing the utilization of the HACCP system even in smaller production units (16).

To improve nutrient balance, there is a need to train the heads of production units to choose the adequate sources of protein, lipids, minerals and vitamins and to make an adequate formula.

To improve nutrient bio-availability, heat treatment like roasting and extrusion cooking or biological treatments like fermentation or incorporation of malted flours can be used (14).

To improve energy density of a gruel, it is necessary to induce a partial degradation of starch, which reduces viscosity drastically and allows the preparation of gruels with both higher dry matter content and appropriate consistency. In the contexts of developing countries two ways (i.e., enzymatic or thermo-mechanical hydrolysis) can be proposed to decrease viscosity (19).

The first way to incorporate malted cereal flours, which can be realized in small-scale production units or at household level. To determine the amount of malted cereal flour needed to prepare a gruel with the appropriate energy density and consistency, all that has to be done is to prepare gruels at required energy density with increasing amounts of malted cereal flour and measure the viscosity of the gruels (Figure 2). Then, on the graph giving the variation of viscosity with amounts of malted cereal flour, it is easy to determine the incorporation rate corresponding to the desired viscosity.

Figure 2: Effect of the incorporation of a malted cereal flour on apparent viscosity (20) of a gruel prepared at an appropriate energy density (120 kcal/100g) from an usual cereal/legume blend.



The second way is by using very low cost extruders of limited capacity, which already exist in some Asian countries. As shown in Figure 3, the maximum acceptable value for viscosity is reached at a concentration of about 10 g of dry matter per 100 g of gruels

prepared with raw rice while the concentration corresponding to the same viscosity is almost the double for a gruel prepared from extruded rice.





Concentration (g DM / 100 g of gruel)

Recent studies have shown that incorporation of a source of amylases into infant flours results in the increase of energy intakes by infants (21-30). Effect of incorporation of amylase can be explained as follows (Figure 4).

Incorporation of amylases results in partial degradation of starch during gruel preparation. This partial degradation into dextrins and maltose probably contributes to increase the sweet taste of the gruel, which improves its appetibility and consequently has a positive effect on food intakes (7). But, above all, partial degradation of starch decreases viscosity, which allows the preparation of a gruel with higher energy density, which strongly influences energy intakes (6,21-30). At the same time the higher energy density may influence the amount consumed by reinforcing the taste of gruels thus increasing its appetibility. However, satiety might be reached sooner, and thus diminishing food intake (7). Finally, the increase of energy intake is the result of the perception by the child of the various modifications induced by the amylase incorporation.

148



Figure 4: Effect of incorporation of amylases on energy intakes

Potential strategies to improve complementary feeding

To improve complementary feeding in a given context, it is necessary not only to propose practical solutions to make accessible complementary foods with the required characteristics but also to pass on the requisite nutritional knowledge about the best way to use them. Until now, there are two common strategies which include the promotion of complementary foods produced at different levels and the implementation of nutrition education campaigns in order to promote simultaneously adequate feeding practices (31).

The first one consists in the central production and promotion of infant flours at the lowest price. There are numerous examples where large-scale production at national level has failed because of supply or distribution difficulties. Implementation of small production units at local level however seems promising if their heads have sufficient technological and management training. The products which consist in instant flours or flours needing cooking can be sold or distributed within the frame of emergency programmes. Because of the difficulties to establish distribution networks in rural areas, the products are mostly meant for urban families.

The second strategy consists in transfers of technology at household or community level. In order to implement it, mothers need to be trained in the preparation of safe complementary foods with good nutritional value using improved recipes. The targeted infants are mostly those belonging to households with low income living in rural areas.

Alternative strategies can be proposed in some contexts. For contexts where traditional products from small scale production units are frequently used as complementary foods, which is the case for fermented products in various countries, improvement of traditional processes followed by transfer of the improved processes to producers can be an interesting strategy. The number of people to train is considerably lower than in the case of technology transfer at household level. As for the two main strategies presented above, the main difficulty consists in convincing caregivers of the advantages of the improved products.

Another alternative strategy is the central production and promotion of food complements designed for being added to cereal based home made gruels. These food complements have to contain minerals and vitamins, sources of amylases, and eventually sources of protein, lipid and aroma. Their main advantage is that they are considerably cheaper than infant flours and allow the preparation of complementary foods of similar nutritional value and appetibility. Another advantage in rice consuming countries lies in the possibility to add them not only to rice flour but also to traditional preparations obtained by partially crushing rice grains cooked for a long time in an excess of water in order to obtain semi-gruels with acceptable energy density and consistency. These food complements can be sold or distributed in both urban and rural areas.

Conclusion

From this general presentation relative to the importance of complementary foods when promoting growth and development of infants and young children, it would be useful to remember that:

- Access to appropriate complementary foods, in particular at the beginning of the weaning period, is a necessary condition to satisfactory growth and development;
- Complementary foods must have characteristics adapted to the physiological and anatomical constraints of the child and to the socio-economical constraints of developing countries;

- Most of the complementary foods presently used in developing countries are inappropriate;
- There is no universal solution to make appropriate complementary foods accessible to infants and young children: their formulation and manufacturing processes as well as the strategies for promoting their use must be adapted to each context.

Success of strategies depends mainly on the ability of concerned people of different sectors to work together at the conceptual (i.e., between public health scientists and food technologists) and operational levels (i.e., between health services and local complementary food producers).

References

- 1. WHO. Complementary feeding of young children in developing countries: a review of current scientific knowledge. WHO/NUT/98.1. *Geneva*, 1998.
- 2. Motarjemi Y, Kaferstein F, Moy G, Quevedo F. Contaminated weaning food: a major risk factor for diarrhoea and associated malnutrition. *Bull World Health Organ.* 1993;**71**:79-92.
- Sanchez-Grinan MI, Peerson J, Brown K; Effect of dietary energy density on total ad libitum energy consumption by recovering malnourished children. *Eur J Clin Nutr.* 1992;46:197-204.
- 4. Brown K. Complementary feeding in developing countries: factors affecting energy intake. *Proc Nutr Soc.* 1997;**56**:139-48.
- 5. Trèche S. Factors affecting the energy intake from gruel by breast-fed children in developing countries. Invited conference at the International conference on Infant and Pre-school child Nutrition, 18-21/11/1998. University of Ibadan, Ibadan, Nigeria.
- Vieu M-C, Traoré T, Trèche S. Effects of energy density and sweetness of gruels on Burkinabe infant energy intakes in free living conditions. *Int J Food Sci Nutr.* 2001;**52**:213-218.
- 7. Trèche S. Complementary feeding of infants in developing countries: How to design appetible transitional foods ? Invited conference at satellite meeting «Smelling, Tasting, Eating: focus on development» to the 4th Pangborn Sensory Science Symposium, 21-22/07/2001. *Dijon, France*.
- 8. Church M. Dietary factors in malnutrition: quality and quantity of diet in relation to child development. *Proc Nutr Soc.* 1979;**38**:41-49.
- 9. Ashworth A, Draper A. The potential of traditional technologies for increasing the energy density of weaning foods: A critical review of existing knowledge with particular reference to malting and fermentation. WHO/CDD/EDP/92.4. *Geneva*, 1992
- Trèche S. Influence de la densité énergétique et de la viscosité des bouillies sur les ingérés énergétiques des nourrissons. *Cahiers Santé*. 1996;6:237-243.
- 11. Butte NF. Energy requirements of infants. Eur J Clin Nutr. 1996;50:S24-S36.
- 12. Torun B, Davies PSW, Livingstone MBE, Paolisso M, Sackett R, Spurr. Energy requirements and dietary energy recommendations for children and adolescents 1 to 18 years old. *Eur J Clin Nutr.* 1996;**50**:S37-S81.
- Gibson RS, Ferguson EL, Lehrfeld J. Complementary foods for infant feeding in developing countries: their nutrient adequacy and improvement. *Eur J Clin Nutr.* 1998;**52**:764-770.

- Besançon P. Safety of complementary foods and bioavailability of nutrients. In Dop M-C, Benbouzid D, Trèche S, de Benoist B, Verster A, Delpeuch F (Eds): "Complementary feeding of young children in Africa and the middle-East". World Health Organization (WHO/NHD/99.3 et WHO/AFRO/NUT/99.4). Geneva, 1999:59-73.
- 15. Mouquet C, Guyot JP, Trèche S. Changes in phytate content during traditional processing of cereal into fermented gruels in West-African small-scale units. *Ann Nutr Metab.* 2001;**45**:S16 (abstract).
- FAO/WHO. Fermentation: assessment and research. Report of a FAO/WHO Workshop on fermentation as a household technology to improve food safety. WHO/FNU/FOS/96.1. 1995.
- Trèche S, Lape IM. Viscosity, energy density and osmolality of gruels for infants prepared from locally produced commercial flours in some developing countries. *Int J Food Sci Nutr.* 1999;**50**:117-125.
- Trèche S. A review of infant flour production experiences in Africa. In Dop M-C, Benbouzid D, Trèche S, de Benoist B, Verster A, Delpeuch F (Eds): "Complementary feeding of young children in Africa and the middle-East". World Health Organization (WHO/NHD/99.3 et WHO/AFRO/NUT/99.4). Geneva. 1999:133-140.
- Trèche S. Techniques for improving the energy density of gruel. In Dop M-C, Benbouzid D, Trèche S, de Benoist B, Verster A, Delpeuch F (Eds): "Complementary feeding of young children in Africa and the middle-East". World Health Organization (WHO/NHD/99.3 et WHO/AFRO/NUT/99.4). Geneva. 1999:101-119.
- 20. Mouquet C, Trèche S. Viscosity of gruels for infants: a comparison of measurement procedures. *Int J Food Sci Nutr.* 2001;**52**:389-400.
- Gopaldas T, John C. Evaluation of a controlled 6 months feeding trial on intake by infants and toddlers fed a high energy-low bulk gruel versus a high energy-high bulk gruel in addition to their habitual home diet. *J Trop Pediatr.* 1992;**38**:278-283.
- 22. Mahalanabis D, Faruque ASG, Wahed MA. Energy dense porridge liquefied by amylase of germinated wheat: use in infants with diarrhoea. *Acta Paediatr.* 1993;**82**:603-604.
- 23. Rahman MM, Islam MA, Mahalanabis D, Biswas E, Majid N, Wahed MA. Intake from a energy-dense porridge liquefied by amylase of germinated wheat: a controlled trial in severely malnourished children during convalescence from diarrhoea. *Eur J Clin Nutr.* 1994;**48**:46-53.
- 24. Rahman MM, Mazumder RN, Ali M, Mahalanabis D. Role of amylase-treated, energy-dense liquid diet in the nutritional management of acute shigellosis in children: a controlled clinical trial. *Acta Paediatr.* 1995;**84**:867-872.
- Darling JC, Kitundu JA, Kingamkono RR, Msengi AE, Nduma B, Sullivan KR, Tomkins AM. Improved energy intakes using amylase digested weaning foods in Tanzanian children with acute diarrhoea. *J Pediatr Gastroenterol Nutr.* 1995; 21:73-81.
- Mitra AK, Rahman MM, Mahalanabis D, Patra FC, Wahed MA. Evaluation of an energy-dense meal liquefied with amylase of germinated wheat in children with acute watery diarrhoea: a randomized controlled clinical trial. *Nutr Res.* 1995; 15:939-951.
- 27. Donnen P, Dramaix M, Brasseur D, Bitwe Mihanda R, Fasili S, Trèche S. Highenergy density gruels in the treatment of hospitalized children suffering from mainly protein malnutrition in Zaïre. *Food Nutr Bull.* 1996;**17**:145-153.
- 28. Trèche S, Mbemba F, Dop M-C. Effect of the use of amylase-containing gruel on energy intake and growth of Congolese infants between 4 and 8 months of age. In XVI International Congress of Nutrition (abstract book) 1997:322 (abstract).

- 29. Den Besten L, Glatthaar I, Isselmuiden C. Adding alpha-amylase to weaning food to increase dietary intake in children. A randomized controlled trial. *J Trop Pediatr.* 1998;**44**:4-9.
- 30. Bennett VA, Morales E, Gonzalez J, Peerson JM, de Romana GL, Brown KH. Effects of dietary viscosity and energy density on total daily energy consumption by young Peruvian children. *Am J Clin Nutr.* 1999;**70**:285-291.
- 31. Caulfield LE, Huffman SL, Piwoz EG. Interventions to improve intake of complementary foods by infants 6 to 12 months of age in developing countries: impact on growth and on the prevalence of malnutrition and potential contribution to child survival. *Food Nutr Bull*. 1999;**20**:183-200.

CULTURAL DETERMINANTS OF CHILD HEALTH AND GROWTH IN DEVELOPING COUNTRIES

Bernard Brabin¹

Introduction

Culture is a complex construct and much of our knowledge about it has been learned from anthropologists. Exactly how culture intertwines with child health involves concepts of ethnicity and race. Anthropologists generally agree that culture in the sum total of attitude traditions and beliefs and includes relationships closely related to family function (1). Culture may be considered as the man-made part of the community which relates to laws, myths, superstitions and family values, but it can also be considered with emphasis on group characteristics, for example: language, tribal groupings, or nationality. Socio-economic status conversely refers to larger social groups categorized on the basis of economic characteristics. Given the substantial similarities in the genetic constitution of "races" significant differences in development and health status among children of different racial or ethnic groups may not be primarily determined biologically (although in some is clearly the case, e.g. instances this inheritance of haemoglobinopathies), but rather by cultural practices and socioeconomic conditions (2-4).

Childhood is essentially a cultural experience. It has been suggested that the further back in history one goes, the more likely are children to be killed, abandoned, beaten, terrorized and sexually abused (3). In the medieval period parents treated children like children as well as like adults and there is some evidence that they did so with care and sympathy and that children had cultural activities and possessions of their own (5). During the enlightenment children emerged more as playthings and only privileged groups could afford the luxury of the time, emotion, demands and clothing required to take pleasure in children and to cater for their needs (6).

In the third millennium the child symbolizes a caring society, despite the fact that in many developing countries child morbidity and mortality remain unacceptably high. Some of the harmful customs, traditions and home remedies related to childcare in developing countries are so widespread as to constitute major

¹ Tropical Child Health Group, Liverpool School of Tropical Medicine, Liverpool, UK

causes of child morbidity and mortality in themselves. A framework for classifying some of these practices is outlined in tables 1-3 and some of these are considered individually in the sections below.

Breast feeding customs and patterns

In developing countries there is much variation in traditional child-rearing practices which could affect child growth and development. Despite this variation there is relatively little malnutrition and indeed excellent growth during the first six months or so of life in babies of normal birthweight. In traditional societies the initiation and maintenance of lactation is usually successful and is promoted by close and continuing contact with the mother facilitating ad libitum feeding. Close mothering is made easier in many cultures by traditional methods of baby carrying and Jellife described how African languages have the same word for both the amniotic membranes and the backcloths used for carrying babies. For example "nkozi" among the Luganda, and "ingobyi"

Breast-feeding practices and weaning customs have a direct bearing on nutritional problems in childhood (Table 1). The importance of breast-feeding in late infancy and early childhood varies considerably between developing and industrialized countries as a result of the wide differences in the cultural and socioeconomic situations of mothers who choose to breast-feed for prolonged periods. Over 95% of babies in developing countries are initially breast-feed and most children continue to receive some breast-feeding until 6 months of age. After six months large differences in breast-feeding practice between countries are observed.

The limited evidence available suggests that child growth is not influenced by continuing to receive breastmilk after 6 months of age in addition to appropriate amounts of other foods (8). In poor areas of developing countries breast-feeding after early infancy may have a number of major nutritional benefits. Longitudinal studies in Africa and Latin America have provided evidence that the shortest children are sometimes the last to be weaned and low height-for-age and weight-for-age prior to weaning has been shown to remain significantly associated with delayed weaning (9). The habit of postponing weaning of stunted children probably explains why breast-fed children have lower height for age than weaning children in a Senegalese study (10).

The risks of abandoning breast-feeding for artificial feeding is unfortunate and this practice is often lead by more educated women. Less fortunate, often illiterate mothers have neither the means nor the knowledge to successfully adopt artificial feeding.

Although HIV transmission through breast-feeding is a significant cause of HIV infection, there is no evidence that the risks of child morbidity or mortality associated with artificial feeding have diminished especially in poor communities and breast-feeding promotion should be supported and strengthened in all settings irrespective of the prevalence of HIV (11,12).

Table 1:

Practice	Consequence	Region/Country*
Prolonged exclusive breast-	Iron deficiency anaemia,	Africa/Asia
feeding with inadequate	stunting	
supplementation		
Sudden withdrawal of	Kwashiorkor	Africa
breast-feeding		
Early introduction of infant	?Increased risk of HIV	Kenya
weaning foods		-
Food avoidance	Nutrient deficiencies	Africa/Asia
Discarding colostrum	Lowering of gastro-intestinal	Indian sub-
-	defences	continent
Geophagy	Hookworm infection	East Africa
Cooking in iron pots	Improved iron status	South Africa

* Known case reports or published studies

Weaning customs and child health (Table 1)

During the second six months of infancy, breastmilk continues to be of importance; but as a supplement to other food items introduced during the period of weaning (7). This period is one of the most hazardous in the life of children in developing countries and the earlier this occurs the greater the hazard. In traditional African societies breast-feeding is mostly continued for as long as possible, usually for two or even three years, but if pregnancy occurs breast-feeding is usually terminated. The duration of breast-feeding is thus largely determined by the interval between pregnancies and this is often regulated in traditional societies by customs, which restrict sexual intercourse for varying periods after childbirth. Hendrickse has commented that amongst the Yoruba in Nigeria the age of onset of Kwashiorkor is mainly between two and three years of age (13). This is later than in communities which discontinue breast-feeding earlier. Occasionally "late marasmus" can occur as a result of "breast starvation". This can develop if the young child is continued on breast-feeding into the second year of life unsupplemented even with inadequate transitional foods (7).

Methods of separation of the baby from the mother's milk vary considerably in relation to infant age and suddenness. Among the Baganda of East Africa, the child is taken from the breast abruptly and sent to stay with a relative, which can precipitate Kwashiorkor ("disease of the displaced child"). The separation may be enforced by the application of bitter substances to the breast (aloes, red pepper or soot)(7). A more gradual process may be followed with special foods as a form of compensation.

The pattern of food distribution within traditional families, which often follow culturally determined patterns, may have significant influences on the recently weaned child in the African setting. Young children may not adjust well to the single meal a day routine, and if left to feed for themselves may not have sufficient dexterity to manage well when "dipping from the same pot". The composition of the meals may be inappropriate for the palate of young children if spicy ingredients are used for flavouring. There is frequently little recognition of the special needs of young children and local taboos may place restrictions on consumption of nutritious food. For example, eggs are regarded as harmful in many countries in West Africa. They are considered to cause children to become thieves, or to delay closure of the fontanel (Yoruba, Nigeria), and to cause too early breaking of the voice in boys and moral laxity in girls (Northern Ghana) (13).

Customs such as cooking foods prepared in iron pots may be very beneficial in preventing iron deficiency anaemia (14). A small number of studies have examined this practice which has been shown to reduce anaemia and iron deficiency in children even in areas where malaria transmission occurs. Improved designs for these pots could improve acceptability in areas where their use is not traditional.

Culture, illness and care

In societies where the extended family is the norm, often young parents are considered too inexperienced to make treatment decisions on behalf of their child and key decisions are made frequently in combination with grandparents, older relatives or traditional practitioners. The care and financial support may also come from the extended family. Societies will differ not only in the central role played by families, but also in their hierarchical structures. Distinct lines for decision making may be drawn between the members of the society.

There is often substantial variability in childcare practices within cultural groups and efforts to homogenize ethnic groups may mask this variability. A study of Haitian American and Cuban American mothers found that the two groups had a different understanding of the aetiology of illnesses affecting infants and preschool children (15). The Cuban sample had a westernized approach to early childhood disease and their causes, and they frequently cited giving prescribed medications as the appropriate treatment. In contrast, Haitian mothers did not identify disease or its causes with biomedical terminology. Rather, they described illnesses as caused by external circumstances, such as bad air, dirty objects, or spells. Haitian mothers also listed home remedies more frequently and were more likely to take their child to a traditional healer. Their choices of treatment were based on their own understanding of the causes of the illnesses, and over half did not think the conditions they mentioned were preventable (15).

Some traditional cultures espouse supernatural explanations of problems. Members of these cultures attribute many childhood illnesses to the influence of gods, malevolent spirits and spells. Similarly, some cultures interpret problems as retribution for wrongdoing, either for their own or their ancestors' behaviour. The child in these circumstances may be chastised, cleansed or punished, employing harmful procedures (Table 2). It is also possible, in such circumstances, that families may consider a child's difficulties as fated. In these instances, intervention is **often** disregarded because it is considered futile.

Practice	Condition	Consequence	Region/Country*
Unhygienic Surgery			
Umbilical cord cutting	None	Neonatal tetanus	Africa/Asia
Male circumcision	None	Increased hepatitis B or HIV risk	Africa
Female circumcision	None	Mutilation. Obstructed labour Vesico-vaginal fistula Skin infection,	N.Africa
Skin burning, cautory	Breathlessnes; convulsions; Meningitis; jaundice	contractures	W. and E. Africa, Yemen
Skin scarring	Hepatomegaly, eye infection	Scars and infection	Kenya, Malawi
Uvulectomy	None	Haemorrhage and infection	N.W. and East Africa
Removal of teeth	Upper respiratory infection	Local infection	East Africa

 Table 2: Harmful procedures

158

		1	
Physical Abuse			
Tight wrapping of infants	None	Physical deformity	Asia
Total body	None	Rickets and stunting	Africa, Asia
Child abuse	None	Emotional and physical deprivation. Battered baby syndrome Skin infection and	Global
Pouring boiling oil on joint	Arthritis	Severe skin complications and	Libya
Burning (holding child over a fire)	Convulsions	burns Road traffic accidents Females and twins at	Nigeria
Street children	None	greater risk	Africa, Asia,
Infanticide	None		South America W.Africa/ India

 Table 2: Harmful procedures (continued)

* Known case reports, published studies or personal communications

Traditional home remedies or "native medicines" are sometimes used for a variety of complaints (Table 3)(16). An example is the cows-urine-tobacco concoctions widely used in West Africa for convulsions in childhood which cause central nervous system depression and hypoglycaemia. Other examples are listed in table 1. When herbal medicines are used some of these may be beneficial but many can be harmful. The application of heat or cautery by direct exposure for home management may result in serious injury or deformity. Similarly scarifications and application of harmful substances may cause serious damage to the skin or physical harm to the eye. Unhygienic surgery may have similar results.

Some of the worst management seen in developing countries is attributable to quacks who exploit gullible people who may turn to them in preference to medical services or when medical services are absent (17). Such treatment can seriously delay appropriate interventions by medically trained personnel. The current WHO initiative to improve the care of the sick child - the Integrated Management of Childhood Illness - which aims to improve early diagnosis and management will have reduced effectiveness unless some of these barriers related to traditional practices can either be overcome, or when beneficial incorporated into management strategy.

Practice	Condition	Consequence	Region/Country*
Red pepper in eye	Convulsions	Blindness	Sudan
Cows-urine-	Convulsions	CNS depression,	West Africa
tobacco mixture		hypoglycaemia	
Eye medicines	Conjunctivitis	Blindness	Africa
Bowel medicines	Diarrhoea	Intestinal	Malawi
		obstruction,	
		dehydration	
Fever medicines	Malaria	Late referral	East Africa
Lactation	None	Acquired prothrombin	Singapore
medicines		deficiency causing	
		bleeding in infant	
Lead containing	None	Lead poisoning	Arab States
medicines			
(cosmetics)			
Bush teas	Diarrhoea	Veno-occlusive liver	Caribbean
	~ .	disease	
Application of	Sunken	Late referral leading	Zimbabwe
anterior fontanelle	fontanelle and	to severe	
medicines	dehydration	dehydration	
Traditional	Leg or arm	Gangrene	East & West Africa
medicines	fractures		
Plant snakebite	Snake-bite	Delayed referral	Nicaragua
medicine			

Table 3: Traditional medicines

* Known case reports, published studies or personal communications

At risk cultural groups

1) Female child

In spite of the female biological advantage, girls in the developing world appear to have higher mortality risks relative to boys for a given mortality level than was the case historically in the non-developed countries at comparable mortality levels (18). In Bangladesh there is a powerful pattern of parental discrimination against girls. The fact that mortality is much higher among girls with older sisters than among those without suggests that higher female mortality is not primarily a result of cultural practices, which treat all girls differently from boys. Conversely it suggests a selective neglect of individual girls (19). As figure 1 indicates, sex mortality differentials in Bangladesh emerge only after the first half-year of life.

160

Figure 1:

Two hypotheses have been advanced to explain the greater vulnerability of girls:

- Sex differences in childhood for specific causes of death are relatively constant. If girls have higher total mortality it is because causes of death (such as pneumonia or intestinal infections) which are known to have a female excess, are epidemiologically more important in females.
- Gender discrimination, which arises through less adequate nutrition and health care for girls as well as female infanticide.

There is a demographic pattern also observable: that girls have higher mortality rates in countries with low life expectancies, while boys have higher mortality rates in countries with higher life expectancies. The main reason for this is that in high life expectancy countries, death due to infectious diseases is generally low and males predominantly die from acts of violence and accidents. For the same reason, excess female mortality can most clearly be defined amongst children aged 1-4 years, because this is the age range least dominated by specific male-related causes of death (including those associated with male deaths in the neonatal period). The pattern of excess female child mortality is not seen everywhere - it has been most studied in South Asia and the Americas. Excess female mortality beyond childhood into adolescence seems restricted to South Asia, West Asia and the North African regions. Overall, the evidence suggests that, if total mortality is not dominated by certain causes of death that consistently have a male excess, that excess female mortality may result of discrimination in nutrition and health care.

There is some evidence that childcare practices favouring boys increases the risk of protein energy malnutrition in an age dependent way (20). Based on an analysis of cross-sectional surveys (DHS) from over 20 countries in all regions of the world there was little difference between the sexes for the underfives in prevalence of stunting, underweight and wasting. When younger boys (<24 months) were compared to younger girls, boys tended to be more malnourished; but with children 24-35 months old there was an equal or reversed prevalence. This implies that the situation for girls worsens. After 35 months the sex prevalence of malnutrition tended to be equal. A higher incidence of Kwashiorkor among female children has also been reported in Nigeria and ascribed to their less privileged place in society (16).

2) Social behaviour and rickets

Rickets has been ranked among the five most prevalent diseases in developing countries. Cultural factors in the aetiology of rickets are of considerable importance. Rickets is caused by a lack of vitamin D, which leads to a severe disorder of bone growth and subsequent growth failure. These children are also more susceptible to infectious diseases including tuberculosis. Vitamin D is obtained from dietary sources and can be synthesized in the skin. In view of this it would seem unlikely that rickets would occur in tropical Africa. Yet it has been described recently in Nigeria, where it was related to both vitamin D and calcium deficiency (21). In Western Nigeria, North Africa, Ethiopia, Pakistan, Yemen and parts of the Middle East it occurs amongst the children of Moslem members of the community and is due to the practice of purdah which requires women to totally cover their skin from the eyes of any man but their husband. Infants born to these women are denied adequate exposure to sunlight and their diets are often also deficient in vitamin D and calcium and in consequence they frequently develop rickets. In Ethiopia a fair skin is prized and parents may go to elaborate lengths to ensure that their babies are not exposed to the

tanning effects of sunlight. Sub-clinical deficiency may be common and in a recent survey amongst Somalian immigrant girls and young women (10-25 years) in Merseyside, UK, 87.2% had abnormal blood biochemistry indicating rickets.

3) Ethnic minority children

The problems of this group have been reviewed by Aukett and Wharton (22), who indicated that it is often difficult to decide how much of the nutritional problems of these groups are due to their ethnicity and cultural practices and how much to other social and economic factors such as poverty. It is difficult therefore to assess whether ethnic group membership places children at greater risk than the general population because of the inter-relationship with poverty and low socio-economic status. For some specific diseases ethnic minorities may be at special risk (e.g. hepatitis B infection) (23).

There are many sub-ethnic differences in the diet of children of mothers from the Indian sub-continent. Particular nutritional problems worth highlighting include growth faltering, rickets and iron deficiency anaemia amongst Asian immigrants to western societies. Amongst Chinese and Vietnamese cultural food traditions can be very strong and rickets and iron deficiency are well described.

4) Polygyny: an indicator of nutritional stress

A number of nutritional surveys have tried to assess the influence of polygyny on the incidence of malnutrition, however polygyny varies widely between societies in its presentation, distribution and intensity and controlling for all those factors is difficult (24). Resources within polygynous societies may be distributed to the detriment of women and children. Curlev compared smallholdings and receipts of monogamous and polygynous wives and found that a man who maintained one household built larger buildings and maintained them better than a polygynist (25). Also since agricultural produce was not divided, the single wife had more chance of gaining and retaining a cash income. Most importantly a wife in a polygnous household was given a smaller size plot of land to work than a monogamous wife. A detailed examination of polygynous households is necessary to elucidate the process by which women fulfil their responsibility of food provision - a responsibility that continues when economic processes change the division of labour and the traditional patterns of producing goods.

5) Twins in Africa

The twinning rate is about one in twenty births among the Yorubas in Nigeria. It is extremely low in most other African people, sometimes as a result of perinatal infanticide through neglect of the weaker twin, as it may be difficult to successfully breast-feed two infants. The Yoruba term for twins is "Ibeji". All twins are named Taiwo and Kehende. The first born is Taiwo, but in contrast to custom in the West, Kehende, the second born is the senior twin as the first born is regarded as clearing the way for the second. Amongst the Zulu's there is a tradition that as soon as the second twin in is born the husband goes to the forest and selects two small Euphorbia trees and plants them on the women's side of the hut. The twins are carefully washed in a tincture of ground Euphorbia root. The Euphorbias must not be injured for fear of endangering the life of the twin to whom the tree belongs.

Traditionally little wooden carvings called Ibejis were made to represent twins. If a twin dies, then its Ibeji is treated in the same way as the living twin to avoid jealousy, which could harm the survivor. Most Yoruba now appear to be able to resolve the conflicts inherent in the twin-birth situation, so the event is less of an interruption of normal social life than in the past (26).

The survival rate of twins has been little studied in developing countries and there is a scarcity of information available on their growth patterns. There are high risks of transmission of infections between twins, for example tuberculosis and measles and the second born twin is at higher risk of acquiring perinatal infection with HIV. Both neonatal and infant mortality rates are several times higher among twins than singletons and gender differences in mortality are evident. Vitamin A and β -carotene maternal supplementation appears to increase the rate of twinning (27).

Conclusion

The high incidence of nutritional disorders especially in Africa today reflects the interaction between social, cultural and biological factors influencing child health and growth. Policy approaches to improving child health and care should ideally develop from a cultural basis. A cultural reasoning can lead to the introduction of programmes before the chain of events to which malnutrition has been a response has been properly assessed. Innovative methods will be required for the development of culturally successful interventions, especially in areas with high levels of illiteracy.

References

- 1. Brookins GK. Culture, ethnicity and bicultural competence: Implications for children with chronic disease and disability. *Pediatrics*. 1993;**91**:1056-1062.
- Coll CG, Magnuson K. Cultural differences as sources of developmental vulnerabilities and resources. In Shonkoff JP, Meiseh SJ (Eds.): "Handbook of Early Childhood Intervention". 2nd Edition. *Cambridge University Press*, 2000.
- 3. Jenks C. Historical perspectives on childhood. In Lindstrom B, Spencer N (Eds.): "Social Paediatrics". *Oxford University Press*, 1995.
- 4. Barros FC, Victora CG, Horta BL. Ethnicity and infant health in southern Brazil. A birth cohort study. *Int J Epidemiol.* 2001;**30**:1001-1008.
- 5. Orme N. Medieval Children. Yale University Press, 2001.
- Bedaux JB, Ekkart R. Kinderen op hun mooist. Het kinderportret in de Nederlanden, 1500-1700. Ludion Gent, Amsterdam, 2000.
- Jellifee DE, Jelliffe EFP. Traditional societies. In: Human Milk in the Modern World. Psychosocial, Nutritional and Economic Significance. Oxford University Press, 1978;161-181.
- 8. Prentice A. Breast-feeding and the older infant. Acta Paediatr Scand. 1991;**374**:78-88.
- 9. Sibanda-Mulder M, Sibanda-Mulder FGS. Prolonged breastfeeding in Bangladesh: indicators of inadequate feeding practices or mothers response to children's poor health. *Public Health.* 1999;**113**:65-68.
- Simodon KB, Costes R, Delauney V, Diallo A, Simondon F. Children's height, health and appetite influence mother's weaning decisions in rural Senegal. Int J Epidemiol. 2001;30:476-481.
- Coutsoudis A, Pillay K, Spoioner E, Kuhn L, Coovadia HM. Influence of infant feeding patterns on early mother-to-child transmission of HIV-1 in Durban, South Africa: a prospective cohort study. *Lancet.* 1999;**354**:471-476.
- De Cock F, Fowler M, Mercier E. Prevention of mother-to-child HIV transmission in resource-poor countries. Translating research into policy and practice. J Am Med Ass. 2000;283:1175-1182.
- 13. Hendrickse RG. Some observations on the social background to malnutrition in tropical Africa. *African Affairs*. 1966;**65**(261):341-349.
- Abdulaziz AA, Esrey SA, Gyorkos TW, Jean-Baptiste J, Rojhani A. Effect of consumption of food cooked in iron pots on iron status and growth of young children: a randomized trial. *Lancet.* 1999;**353**:712-716
- De Santis L. Health care orientation of Cuban and Haitian immigrant mothers: implications for health care professionals. *Med Anthropol.* 1989;12:69-89
- Ngubane H. Some aspects of treatment among the Zulu. In: JB Loudon (Ed.): Social Anthropology and Medicine. A.S.A. Monograph 13. London: Academic Press, 1976
- 17. Hendrickse RG. Child health in developing countries. In Hendrickse RG, Barr DSD, Mathews TS (Eds.): "Paediatrics in the Tropics". Oxford Scientific Publications, 1991 pages.
- Hill K, Upchurch DM. Gender differences in child health: evidence from the Demographic and Health Surveys. *Population Dev Rev.* 1995;21:127-151
- Muhuri PK, Preston SH. Effects of family composition on mortality differentials by sex among children in Matlab, Bangladesh. *Population Dev Rev.* 1991; 17:415-434
- Sommerfelt E, Arnold F. Sex differentials in nutritional status of young children. In: Too Young to Die: Genes or Genders. Department of Economic and Social Affairs. United Nations. *Population Division*. 1998:133-153
- Thacher TD, Fischer PR, Pettifor J, Lawson JO, Isichei CO, Reading JC, Chan GM. A comparison of calcium, vitamin D or both for nutritional rickets in Nigerian children. *New Eng J Med.* 1999;**341**:563-568

- Aukett MA. Wharton B. Nutrition of Asian children: infants and toddlers. In Cruikshank JK, Beevers DG, Butterworth (Eds.): "Ethnic factors in health and disease". London. 19 ;241-248.
- 23. Aweis D, Brabin BJ, Beeching NJ, Bunn JEG, Cooper C, Gardner K, Iriyagolle C, Hart CA. Hepatitis B prevalence and risk factors for HbsAg carriage amongst Somali households in Liverpool. *Commun Dis Public Health*. 2001;**4**:240-24
- Brabin L. Polygyny: an indicator of nutritional stress in African agricultural societies. Africa. 1983;54:31-5
- 25. Curley RT. Elder, shades and women. Berkeley University of California, 1973
- 26. Chappel TJH. The Yoruba cult of twins in historical perspective. Africa. 1974;**44**:250-265
- Katz J, West KP, Khatry SK, LeCleng SC, Christian P, Pradhan EK, Shrestha SR. Twinning rats and survival of twins in rural Nepal. Int J Epidemiol. 2001;30:802-807

CURRENT AND HYPOTHESIZED PSYCHOSOCIAL INDICATORS OF "CARE FOR NUTRITION" (CAREGIVING BEHAVIOURS AND INTERACTIONS THAT OPTIMIZE THE CHILD'S USE OF FOOD)

Jean-François Bouville

Introduction

In environments with limited food and health resources, child growth and development depend to a greater extent on the caring behaviours of the child's caregiver(s). Care is generally defined, in this context, as the household provision of time, attention and support to meet the physical, mental and social needs of the growing child. Psychosocial aspects of "care for nutrition" include specific characteristics of the child-caregiver relationship, feeding styles and support system associated with the child's nutritional status. Although many studies suggest that malnutrition occurs in conditions where psychosocial care is inadequate, no consensus has been reached to date on specific indicators, causal links and pathways.

We will briefly review currently used psychosocial indicators of "care for nutrition" and suggest others based on a recent longitudinal study of the functional home environments (daily interactions, feeding patterns, and family context) of 32 children aged 6 months to 2 years in Abidjan, Côte d'Ivoire. Among these children, 25 were observed before the onset and during the evolution of potential nutritional symptoms in several neighbourhoods with high levels of slight to moderate malnutrition (every 6 months - or less depending on the family's availability - for 2 consecutive days, 10 hours a day), and 7 others with severe malnutrition were met at the hospital and observed once or twice in the same conditions at home in their second year. Results suggest four sets of psychosocial care indicators associated with specific types of child nutritional development. Potential assessment methods and intervention strategies based on these results will also be discussed.

Concepts and purpose

For many children, malnutrition describes the endpoint of a process that involves medical and nutritional as well as psychological and social influences. There is much evidence of an association between malnutrition and stressors in the family environment and in parent-child interactions (1,2). Care is defined as the provision in the household and the community of time, attention and support to meet the physical, mental and social needs of the growing child. It is increasingly recognized as an important determinant of good health and nutrition among pre-schoolers, along with food security, availability of health services and a healthy environment (3). Although many studies suggest that child malnutrition occurs in conditions where psychosocial care is inadequate, no consensus has been reached to date on specific indicators, causal links and pathways (4).

Psychosocial care for nutrition refers, more specifically, to caregiving behaviours and child-caregiver interactions associated to child nutritional outcome through their influence on the child's use of food. As Engle and Ricciuti (5) recently wrote, "psychosocial care and nutritional care are closely interconnected in the routine caregiving of everyday life and thus should be considered holistically (...) in a unique pattern of behaviours that develops over time." Our purpose is to identify these set patterns of child-caretaker relationships at risk for child malnutrition. A better understanding of the determinants of psychosocial care for nutrition could help improve existing assessment and intervention practices.

Current indicators

Many psychosocial care indicators are empirically associated to child nutritional outcome, but they generally don't provide an understanding of how they relate to one another or to child food intake. Indicators based on individual behaviours are often culture and age specific. Western standards usually predominate, such as mother "shows affection by smiling and friendly behaviour", "rewards achievement", "reprimands without being brusque", "creates a stimulating physical environment for the child" (6), or infant "lack or decreased vocalization", "lack of cuddliness", "poor eye contact", "lack of smiling response" (7). These indicators would scarcely apply in most African settings, for instance, where physical interaction is usually favoured above verbal or visual interaction, mothers keep infants in close proximity most of the time (8), and infant manipulative exploration and use of passive or signaling attachment behaviours take precedence over more active proximity-seeking or following behaviours (9).

Many indicators of the widely used Home Inventory (10), which is based on a configuration of specific caregiving behaviours such as "verbal responsivity", "avoidance and restriction of "provision of appropriate punishment", play materials", "opportunities for variety in daily stimulation", are still somewhat ethnocentric, but also specific, furthermore, to the situations described (no indication of the ways in which these behaviours affect child nutritional outcome). Caregiving models seem more universal in scope, as they consider the quality of the caregiver's behaviours during interaction with the child instead of the actual behaviours involved. A wide range of culture-specific caregiving behaviours can indeed apply to the growth-promoting relational construct described by Engle and Ricciuti (5) : caregiving responsiveness, warmth and affection, acceptance, involvement with the child, encouragement of autonomy and exploration. The question remains, however, of the ways in which these relational qualities are actually implemented in varying situations and cultural contexts, as well as the behavioural processes involved in enhancing or undermining the child's nutritional development.

Contextualization of behaviour

Hence many current psychosocial care indicators are, to some extent, culture-, age- and situation-specific, which limits their use in other contexts. The assessment of caregiving relational quality best approximates the cross-cultural, developmental and ecological indicators we are searching for. Our main objective is to find a way to widen the scope, or "contextualize", the behaviours associated with these caregiving qualities.

Attachment theory, founded by John Bowlby (11, 12) and later developed by Mary Ainsworth (13, 14), provides a wider organizational construct in which to contextualize both caregiving and child behaviours. Very briefly stated, attachment theory considers the fundamental organizing principle of human behaviour to be the overriding need for protection and emotional security. In other words, the child needs attachment security, defined as the state of being secure or untroubled about the availability of the main caregiver. The perceived unavailability of the caregiver leads to insecure attachment.

The four main child-caregiver attachment patterns differ according to a predictable interplay between child proximity seeking

to the attachment figure(s) (mother and other main caregivers) and his/her exploratory behaviours during an experimental situation in which the child is confronted to gradually longer periods of separation (14). Attachment relationships are either:

- Secure infants use their mother as a secure base for exploration;
- Avoidant infants explore but avoid their mother when distressed;
- Resistant infants seek constant proximity to their mother mingled with anger;
- Disordered infants neither explore nor seek proximity to their mother or show signs of fear towards her (freeze and/or cry in her presence) and behave erratically during the Strange Situation procedure (seemingly unfocused and sudden changes in several of these behaviours).

It is important to underscore the fact that insecure attachment relationships are very widespread in the non-clinical, general population, since 20 to 40% of samples (throughout the world, even though most studies were conducted in Western middle-class settings) are found, on average, to be either avoidant (10-20%) or resistant (10-20%) - attachment disorder alone (5-10%) is indicative of psychopathology (15). Furthermore, much higher levels of insecure relationships are found in "at-risk" populations (68% in a low-economic Dutch sample, for example (16)).

Hypothesized ecological model

Working on naturalistic attachment patterns among the Dogon of Mali, McMahan True et al. (8) stated that the most dramatic demonstration of the adaptive value of attachment security was its role as a protective factor against malnutrition. Other authors, such as Dixon, Levine and Brazelton (17), for example, long ago identified malnutrition as a symptom of a disorder of attachment, and a recent study conducted in Chile (18) reports an empirical link between insecure attachment and malnutrition.

In an attempt to better understand underlying behavioural and relational factors of child malnutrition, we recently conducted a longitudinal study (19) on the naturally occurring attachment patterns and feeding interactions of 32 children aged 6 months to 2 years in the multiethnic urban population of Abidjan, in Côte d'Ivoire. 25 of these children were observed before the onset and during the evolution of (potential) nutritional symptoms in several neighbourhoods with high levels of slight to moderate malnutrition (observations every 6 months for 2 consecutive days, 10 hours a day), and seven others with severe malnutrition were met at the hospital and observed once or twice in the same conditions at home in their second year. Early interactions, before the onset of nutritional symptoms (at 6 months of age) were the most strongly associated with subsequent nutritional outcome.

Based on the results of this study, we devised a hypothetical model of the link between global interactions, feeding interactions, food intake and child nutritional outcome (see Graph). Children who remained *healthy* from a nutritional standpoint benefited from a secure relationship with their mothers, associated with maternal sensitivity – the appropriate response to the child's signals and demands in a timely manner. This secure base allows, as we previously mentioned, the child's exploration of the environment, including the realm of food diversity. Hence the child accepts to eat, and food intake is adequate.

	Global interactions	Feeding interactions	Food intake	Nutritional outcome	
Secure Attachment	M. sensitive I. explores env.	M. sensitive I. explores food	Adequate	Healthy	
Insecure avoidant	Overstimulation I. "to himself"	M. overprotective I. picky eater	Irregular (selection)	Stationary weight	
Insecure resistant	M. unresponsive I. ambivalent	M. force-feeds I. opposition	Low (refusal)	ow Slight/moderate fusal) malnutrition	
Attachment disorder	M. disengaged I. apathetic	M. laissez-faire I. disinterest	Very low (parsimony)	mony) Severe malnutrition	

Graph: Hypothesized psychosocial care for nutrition model

Children with *stationary weight* (for three months or more during the first two years of life) participated in an avoidant attachment relationship in which their mothers were somewhat intrusive, excessively stimulating, and strongly overprotective. During the feeding situation, it was not uncommon for mothers to follow the child around with a spoon to feed him/her when distracted. These behaviours were often seen after an early period of force-feeding during which these children often became overweight, so their picky eating and stationary weight during their second or third semester of life might actually be adaptive.

Children who suffered from *slight to moderate malnutrition* mostly had resistant attachment behaviours related to an unresponsive, underinvolved approach to caregiving. Mothers tended to actively reject or ignore their child in distress while he/her almost constantly required close physical contact, resisted being put down, and showed excessive fear of strangers. They also took a longer time to respond to the child's demands, seldom approached him/her spontaneously, and rarely partook in social interactions such as playing or exchanging without a specific physical need to be met. Mothers were "busy elsewhere", as it were, and sometimes treated their clinging and angry child as a burden. Meals were to be quickly dealt with by force-feeding, but the child usually resisted this lack of attention to his/her emotional needs by actively refusing to be fed, leading to a low level of food ingestion.

The attachment relationship of children with severe malnutrition seemed difficult to establish; an attachment disorder characterized by little emotional engagement between mother and child (both are somewhat passive, aloof and apathetic) despite the mother's continued physical presence. These children showed very little fear of strangers, and generally "accepted" to be held and even taken some distance by unknown people (unlike avoidant children). Lack of emotional contact with mother also puts food at a distance, so to speak, and children behaved as if they were never hungry, eating a bite here and there but never more. Mothers either passively "accepted" their child's anorexic behaviour without trying to bring him/her to eat, or attempted to force-feed him/her at times without insisting on a regular basis or during an entire meal. Hence the child's food intake was very low.

Assessment and intervention

Child malnutrition programmes could greatly benefit from a better understanding of these specific behaviours and interactions associated with the onset and evolution of symptoms. Their assessment and intervention can be considered together, to some extent, since taking the time and the energy to observe the relationship, asking the mother informed questions about it, listening to her answers, and pointing in a non-judgmental way to possible courses of action are all ways to provide attention and acceptance to the child and caretaker's emotional needs. It seems vitally important in developing countries that this type of community caring also include other caretakers than the mother, such as the child's older siblings and aunts, for instance, to help provide the time and attention children need to grow. Social interactions with the child are very important in this respect, and were often found to be associated with positive nutritional evolution in our longitudinal study. These playful and cuddling interactions can help alleviate insecure attachment patterns by providing a secure base for the child's exploration of the environment, including the realm of food diversity.

Other prospective empirical studies conducted on a wider scale in various settings would help refine and culturally adapt hypothesized psychosocial indicators of care for nutrition. Several assessment methods of global and feeding interactions could be used in this process such as Chatoor, Getson and Menvielle's (20). Feeding Scale (distinction between several attachment-based early feeding disorders), Water and Dean's (21) Attachment Q-Sorts (assessment of child attachment patterns in natural settings), and the McMahan True et al. (8) Baby Weigh-In Examination (assessment of mother-infant communication patterns during the well-baby weighing procedure). This last assessment method also interestingly provides both the possibility for relational assessment and an informed basis for dialogue with the child's caretaker during a widely-used standard growth monitoring procedure.

References

- 1. Ward MJ, Brazelton TB, Wüst M. Toward Understanding the Role of Attachment in Malnutrition. In: Kessler DB & Dawson P. (Eds.): "Failure to Thrive and Pediatric Undernutrition". *Baltimore: Brookes Publishing*, 1999;411-423.
- 2. Smith LC, Haddad L. Explaining Child Malnutrition in Developing Countries: A Cross-Country Analysis. Discussion Paper N° 60. *FCND*, 1999.
- 3. UNICEF. Strategy for Improved Nutrition of Children and Women in Developing Countries. *New York: UNICEF Policy Review Paper*, 1990.
- Valenzuela M. Maternal Sensitivity in a Developing Society: The Context of Urban Poverty and Infant Chronic Undernutrition. *Developmental Psychology*. 1997;**33**(5):845-855.
- 5. Engle PL, Ricciuti N. Psychosocial Aspects of Care and Nutrition. *Food Nutr Bull.* 1995;**16**(4):356-377.
- 6. Zeitlin MF, Ghassemi H, Mansour M. Positive Deviance in Child Nutrition. *Tokyo: United Nations University Press*, 1990.
- 7. Powell FF, Low J. Behaviour in Non-Organic Failure-To-Thrive. *Development and Behavioural Pediatrics*. 1983;**4**:26-33.
- 8. McMahan True M, Pisani L, Oumar F. Infant-Mother Attachment among the Dogon of Mali. *Child Development.* 2001;**72**(5):1451-1466.
- Marvin RS, VanDevender TL, Iwanaga M, LeVine S, LeVine RA. Infant- Caregiver Attachment among the Hausa of Nigeria. In: McGurk HM (Ed.): "Ecological Factors in Human Development". Amsterdam: N. Holland Publishing Co, 1977;247-260.
- 10. Caldwell BM, Bradley RH. Home Observation for Measurement of the Environment. *Little Rock: University of Arkansas*, 1984.

- 11. Bowlby J. Child Care and the Growth of Love. Harmondsworth: Penguin, 1953.
- 12. Bowlby J. Attachment. Londres: Basic Books, 1969.
- 13. Ainsworth MDS. Infancy in Uganda : Infant Care and the Growth of Love. Baltimore: John Hopkins University Press, 1967.
- Ainsworth MDS, Blehar MC, Waters E, Wall S. Patterns of Attachment : A Psychological Study of the Strange Situation. New Jersey: Erlbaum, Hillsdale, 1978.
- 15. Van Ijzendoorn M, Kroonenberg PM. Cross-cultural patterns of Attachment. A meta-analysis of the Strange Situation. *Child Development*. 1988;**59**:147-156.
- Van den Boom DC. Preventive Intervention and the Quality of Mother-Infant Interaction and Infant Exploration in Irritable Infants. In: Koops W. (Ed.): "Developmental Psychology Behind the Dikes". Amsterdam: Eburon, 1990;249-270.
- 17. Dixon SD, Levine RA, Brazelton TB. Malnutrition: A Closer Look at the Problem in an East African Village. *Dev Med Child Neurol.* 1982;**24**:670-685.
- Valenzuela M. Attachment in Chronically Underweight Young Children. Child Development. 1990;61:1984-1995.
- 19. Bouville J-F. Child Malnutrition, Mother-Child Attachment, and Family Context in an Urban African Environment (Abidjan, Côte d'Ivoire). Unpublished Doctoral dissertation. University Paris VIII, 2001.
- Chatoor I, Getson P, Menvielle E, Brasseaux C, O'Donnell R, Riivera Y, Mrazek DA. A Feeding Scale for Research and Clinical Practice to Assess Mother-Infant Interactions in the First Three Years of Life. *Infant Ment Health J.* 1997;**18**(1):76-81.
- 21. Waters E, Deane KE. Defining and Assessing Individual Differences in Attachment Relationships. In: Bretherton I and Waters E (Eds.), Growing Points of Attachment Theory and Research. *Monographs of the Society for Research in Child Development*. 1985;**50**:41-103.
AN ETHNOGRAPHIC STUDY OF THE INFLUENCES ON MATERNAL DECISION-MAKING ABOUT INFANT FEEDING PRACTICES IN RURAL BANGLADESH

Purnima Menon¹,Nazneen Akhtar²,Jean-Pierre Habicht¹

Introduction

Bangladesh has some of the highest prevalences of young child malnutrition in the world. The overall prevalence of stunting, underweight and wasting among children less than 36 months of age are 49%, 54% and 21%, respectively (Figure 1).



The trends in these indicators by age indicates that the prevalence of stunting almost doubles from about 30% among children between 6 and 11 months of age to 57% among children 12 and 36 months of age. Similar patterns are seen for both wasting

¹ Program in International Nutrition, Cornell University, Ithaca, NY

² Technical Assistance for the Education and Rehabilitation of the Blind, Helen Keller International, Dhaka, Bangladesh

and underweight. These patterns reflect the vulnerability of children between 6 and 36 months of age and are indicative of deterioration in nutritional status that are likely due to a combination of poor feeding practices and high disease rates.

Previous research on infant feeding practices in Bangladesh has documented almost universal breast-feeding rates with long duration (up to 2 years of age), but low rates of exclusive breastfeeding and poor complementary feeding practices (1,2). While a number of studies have documented breast feeding and to some extent, complementary feeding practices of mothers of young children in Bangladesh, there are few studies that have examined these practices in a socio-cultural context with an emphasis on understanding the various influences on decisions that mothers make about caring for their infants. In order to be able to influence behaviour change, it is critical to understand the process of formation of knowledge and the factors that influence the translation of knowledge into action.

This ethnographic study was part of a larger study to understand the mechanisms through which maternal schooling affects child health. It is based on findings that in a similar Bangladeshi population, children of better-educated mothers were better nourished that children of women with less or no schooling. Also, it was shown that this influence was partially mediated through caring behaviours such as child and maternal cleanliness (3). This qualitative study was undertaken to document the differences in caring behaviours of women with different levels of schooling and to understand some of the mechanisms through which schooling might have contributed to those differences, in the process collecting data about decision-making around infant care practices. This paper will report the general findings related to infant feeding practices and outline the broad decision-making framework that appears to operate in this context.

Figure 2 lays out the conceptual framework used to guide the ethnographic research. This framework assumes that maternal characteristics will interact with household characteristics to influence the knowledge base, attitudes and feeding choices that a mother will make for each of her children. Examples of maternal characteristics are maternal schooling, age, and previous childcare experiences while examples of household characteristics include household resource availability, family composition, and education levels of other household members. Other factors that can be expected to influence maternal knowledge and attitudes are information from books, radio and television on child feeding and care.

Figure 2: A conceptual framework for the qualitative investigation of factors that influence childcare practices.

Adapted from (Lutter in press) & the Fourth Report on the World Nutrition Situation, 2001.



177

Methods

This study was conducted in Kathali village, which is located in Bhaluka thana, about 80 kilometres northeast of Dhaka, the capital of Bangladesh. This thana was selected after extensive discussions with programme officials at the Bangladesh Rural Advancement Committee (BRAC), an NGO that has a widespread coverage in the country. In order to understand the influence of maternal schooling on caring practices, it was important to select a site that had experienced minimal contact with NGO health programmes, since such contact could have decreased the variability in practices in the community. The BRAC office in Bhaluka had been operational for less than five years, and did not have an extensive health outreach programme.

Within the programme area, the village of Kathali was selected for its proximity to the area office, the highway and ease of access. Roads in the area were poorly developed and since it was a highland area, access via boats is not possible, as it is in lowland areas. The village of Kathali stretched from the highway to about 5 kilometres inland and was accessible primarily by rickshaw or on foot. Selecting a more remote site would have increased the travel time to the research site from and enabled less close contacts with the study participants.

Sample selection

In order to ensure that interviewees were selected from all Socio Economic Status (SES) and schooling levels within the village, we used two participatory rural appraisal (PRA) techniques called social mapping and wealth ranking. The village was naturally divided into a number of clusters of about 50 households, called paras. The PRA exercises were conducted in five paras. The social mapping exercise is a group activity and it was used to generate a list of all households in a para with the help of a number of villagers representing various socio-economic levels in the para. For the wealth ranking, the group was asked to sort a pile of index cards with the names of the household heads on it into different groups based on their wealth status. They then identified each group (e.g., "bhalo chale", meaning "goes well", for the wealthiest group) and described the characteristics of each group in terms of household food security, household structure, possession of livestock and poultry, and types of employment.

Primiparous women (n=20) were selected to be interviewed from different SES and schooling groups within each para.

Primiparous women were interviewed because it is expected that women's experiences with their first child would influence feeding and care practices substantially for their second child. From a research perspective, we wanted to ensure that the primary relationship we were exploring, i.e., between maternal schooling and caring practices, was not influenced by maternal childcare experience.

Data collection

Data on the influence of maternal schooling on childcare outcomes was gathered primarily through in-depth interviews with individual women. The interviews followed a feeding and childcare history format, with probes to understand the factors that influenced each major decision about feeding and care during illness. A research assistant conducted the interviews in Bangla. All interviews were taped, then translated into English and transcribed. The research assistant was trained to give literal translations of the taped interviews, rather than interpretive translations based on her understanding of the interview.

In addition to the in-depth interviews, other data collection methods used were free-listing exercises to list foods that were considered appropriate and were commonly fed to children of different ages, interviews with key informants and older women, observations of child and household cleanliness and a number of group discussions with women and men.

Interview themes

The in-depth interviews were conducted in the form of feeding history interviews, starting with initiation of breast-feeding and ending with transition to adult diet (depending on age of the child). The interview guide for the feeding history interview was adapted from the exploratory phase interview guidelines in the TIPS manual (4). All questions relating to feeding decisions were followed up with probes to understand who or what influenced each action. The interviews also included questions related to care seeking during the last illness episode (with a focus on diarrhoea/acute respiratory infection). Questions were designed to elicit information about what was done for the last illness episode, when it was done and who took the decisions relating to care during the illness episode. Data analysis was done using Atlas-ti (5) for the qualitative interview data and SPSS (6) for quantitative data. Results will be presented here only for infant feeding practices.

Results

Description of the study setting

The village is situated eighty km north east of Dhaka and high on the banks of the Bhaluka river. This village is bounded on the northern end by the Bhaluka river, a tributary of the Padma river, on the west end by the Dhaka-Mymensingh highway. Its southern and eastern ends are contiguous with neighbouring villages. The area is designated as a highland area. Many villages in Bangladesh are situated in lowlands, or close to major rivers that spill over their banks during the rainy season and flood the villages on their banks repeatedly.

Like the majority of villages in Bangladesh, the community structure in Kathali consisted of a number of "*paras*", clusters of up to 50 households that are situated close to one another, but separated from the next *para* by an easily distinguishable tract of land or water (e.g., paddy fields or streams). This is depicted schematically in Figure 3. The main marketplace was situated in Bhaluka town, one kilometre north of the village, along the highway and across the river. In addition to grocery stalls, the market had a number of shops that sold dry goods, clothes, shoes as well as small pharmacies and doctor's offices. Most, if not all, of the shopkeepers, doctors and pharmacists were men. Women were seldom seen in the marketplace, and when they were visible, they were mostly visiting the doctors.

Description of sample

The village mapping and wealth ranking exercises revealed the range of wealth and possessions in the village. At the extreme of poverty were households with no landholdings even for their homestead, which lived in the most rudimentary of houses (mud walls and floor, with thatched roofs), owned no livestock or poultry and who had to borrow money from lenders to make ends meet. At the other end of the wealth spectrum were households that owned large tracts of farming land, livestock, who had surplus grain at the end of the year, and who lived in houses with glazed floors and tin roofs.



Figure 3: Typical geographic and social organization of a Bangladeshi village

The average age of the mothers interviewed was 19.6, with a range from 18 to 26. Their years of schooling ranged from none to 16 years, with a mean of 5.75 years. Only one woman had attended a non-formal schooling in addition to three years of formal primary schooling. The mean years of schooling for husbands was lower, only 4.4 years. The age of the husbands ranged from 22 to 37 years, with a mean of 28.5 years. In general, husbands were substantially older than their wives (mean difference = 8.8 years, range = 4 to 14 years). This difference in age could be responsible for the lower levels of schooling among the husbands since government programmes to promote school attendance had only been operational for the last 5-10 years.

Only two of the women were employed outside the home. Of these, one was a schoolteacher and the other worked in a garment factory. Six of the twenty mothers were involved in NGO activities and had taken loans from local NGOs for income-generation projects (small-scale grain mill, livestock or leasing land to farm). The loans were primarily used by their husbands (in all cases but one). All the families were Muslim. There were a few Hindu households in the village but none of those households had Primiparous women with children in the age range of 6-36 months. The total number of people in the household ranged from 3 to 12 (mean = 4). The total number of people in the homestead ranged from 3 to 40, with a mean of 12.3. Six households did not own any land and lived on other people's lands; seven owned the land on which their homes stood. The remaining owned enough land for their homesteads and for farming.

Forty percent of the children were female. Children's ages ranged from 6 months to 36 months of age, with a mean of 17 months (SD = 9 mo).

Caring practices

This section will describe the caring practices of the overall sample of women interviewed. In spite of the small sample size, the results will be presented in terms of proportions, rather than actual numbers. Also, the influences on specific feeding practices will be discussed, with implications for interventions.

Initiation of breast feeding and breast feeding practices

Prelacteal feeds were almost ubiquitous in this community and only 20% of the infants had never been given prelacteal foods (or foods around the time of the initiation of lactation). Honey, sugar water and cow's milk were the common prelacteal foods and 50% of all children had been given honey. Forty five percent of the children had been given sugar water and 50% of the children had received cow's milk. The prelacteal feeds were mostly given to the new-born infant by an older woman (a mother, grandmother or mother-in-law) in all but one case. The most common reasons cited for giving prelacteal feeds to new-borns were that the infant's throat would be dry, that honey makes the child's voice sweet; and finally that since there was no breastmilk in the first few days, they needed to feed the child something so that it would not be hungry.

Fifty-two percent of mothers reported that they put the baby to the breast within 2 hours but the remaining did so only after 1 day or more. The commonly stated reason for the delay in putting the child to the breast was that the women believed that there would be no breastmilk in first few days and hence, it would be pointless to put the child to the breast. All children but one were currently being breast-fed. This pattern is concurrent with previous research that shows prolonged breast-feeding in Bangladesh. However, most women had not practiced exclusive breast-feeding and a majority of women reported giving the child at least some water after it had been breast-fed (70%). Almost all the others at least gave a few drops at bath-time. Many women and especially older women articulated a belief that children needed to be given water since they did not have the ability to ask for water on their own if they felt thirsty. The amount of water that was reportedly given to infants ranged from few drops once a day at bath-time to sips of water throughout the day. The sources of water in the village were primarily from tube wells.

Introduction of new foods

The first food that was commonly introduced to young infants was a rice (or semolina) gruel made with water and sugar. Mother reported that they prepared a thin gruel ("like milk") for young infants, (3-4 months old) and fed them a thick gruel when they were slightly older. The thin gruel was often fed using a baby bottle and at least one half of the children had been fed using a baby bottle. The thick gruel was fed using a spoon or by hand. Sometimes cow's milk was added to the gruel but only a small proportion of mothers reported that they could afford to add cow's milk to the gruel.

The infants ranged from few days old to few months old (1 - 7 mo, majority around 3 mo) when gruel was introduced into their diets. The gruels were usually fed upon the advice of other older women in the household and the para. The most commonly reported reason for introducing a rice or wheat gruel was that the infant's stomach was not getting full with breastmilk. This was based on the infant crying excessively. Only 20% of the mothers reported that they fed the child a complementary food around 6 months of age because they knew that the infant needed extra food at that age.

At the time of this study, a local traditional complementary food called khichuri was being promoted widely through the media (radio and TV) and by community health workers. Khichuri is a mixture of rice, lentils and vegetables and/or meat cooked together until it reaches a soft consistency. A number of the women reported that they had cooked this at least once for their child, and only 20% reported feeding *khichuri* regularly to their child between the ages of 6 and 12 months of age. Another 10% had fed it regularly between 6 and 9 months of age. A few had tried feeding the khichuri once or twice and then discontinued it because their infants did not react positively to the new food (15%).

There was a perception that while khichuri was a highly desirable food for young children; it was difficult to prepare because a large number of ingredients were required. Twenty percent of mother explicitly stated that they thought they could not afford to make khichuri for their children and this concern was also articulated in two of the focus group discussions with older women and men. The health care messages that promoted khichuri on TV and radio included a number of vegetables like cauliflower. pumpkin, peas and carrots, which were expensive for the villagers to procure and not available at all seasons. This appeared to lead to the perception that it would be difficult to prepare this food on a regular basis for a young child. It is interesting, and encouraging, to note that even though it is rice-based, khichuri is perceived as being different from a rice-based meal since it is a food that was specially prepared for young children (see section on rice based meals below). It would seem that minor modifications to the way in which it is promoted could improve the compliance with programme messages.

Infants were also fed a range of other foods between the ages of 4 to 12 months. These included foods called "*maja*" and some fruits. Foods classified as maja foods were small treats (e.g., candies, a local snack called *chanachur*, biscuits and pieces of bread) that were fed to children by a number of other household members. Fruits that were fed to children in small amounts were grapes and oranges. These were perceived as highly desirable fruits and were expensive. A number of these foods were not fed to the child by the mothers, but by other children and adults in the neighbourhood. Buying treats for children was seen as a common expression of fatherly affection and many fathers had bought these foods for their infants as early as 4 months of age.

Transition to an adult diet

Rice is the staple food in Bangladesh and usually is consumed with a spicy vegetable or fish preparation. When asked about the timing of feeding rice-based meals to infants (including rice mashed with salt, rice with green vegetables and rice with lentils or fish), responses ranged from 6 - 24 mo. Four of the mothers reported that they had introduced rice before the child was a year old and the remaining reported that they fed the child rice based meals only after 12 months of age. Reasons cited for late introduction of rice was that the child would get a potbelly and skinny legs if it were fed rice before 12 months of age. For some women, this perception was based on advice from mothers or mothers-in-law, but for some others it was based on observations of young children who had developed a potbelly and skinny legs after their mothers had introduced rice into their diets. Women also discussed that one of the norms for perceived readiness for rice based meals was when a child reached out for or grabbed rice and/or other foods from their parents' plate.

Frequency of feeding and dietary diversity of meals

Feeding frequency was estimated from the 24-hour recall and dietary diversity from the food frequency questionnaire. While all infants were breast-fed on demand, the frequency of feeding snacks and meals was low. As is common in other developing countries, children were mostly fed at adult mealtimes, and only 3 children were fed more than 4 times a day. The adult meals were 3 times a day: an early morning breakfast, a late afternoon lunch and a late evening dinner. Most children were fed the early morning and late afternoon meals, but many mothers reported the child fell asleep before the evening meal and therefore, was not fed at that time. Only a few mothers (15%) reported making a special effort to feed the child before the family's evening meal so that he or she would have eaten before bedtime. However, this was an uncommon Dietary diversity depended on the availability of occurrence. different foods in the households and this was rarely under the woman's control since most household shopping was done primarily by men. The foods that they brought back were dependent on the resource availability of the households and often on their own preferences.

Encouragement to eat

In the course of the in-depth interviews, mothers were asked what, if anything; they did if their child refused to eat what they wanted to feed it. The responses to this question were encouraging and only one mother stated that she didn't do anything to encourage her child to eat. The responses from the other women ranged from trying a number of different foods (40%) and being persistent in trying to get the child to eat (35%). These included playing games with the food, walking around with the child to distract him or her, singing songs, distracting the child by showing him birds or other things and feeding him while distracted. A small proportion of mothers also indicated that they had tried to forcefeed the child (10%). On the whole, however, there was a belief that children needed to be fed using a variety of methods if they did not eat what was first offered to them. This is different from other cultures (e.g., Mali) where children are not encouraged to eat if they refuse (7) and is encouraging in terms of its implications for nutrition interventions.

The analysis of the 24 hour recalls showed that the initiation of feeding episodes was passive in general and most mothers reported initiating a feeding episode in response to perceived hunger cues like crying, rather than on a schedule. Relative to encouraging children to eat if they rejected certain foods, they articulated a belief that children had to be "made to eat", but it appeared that this belief did not manifest itself in regular feeding habits. This lack of structuring of meals could go along with the cultural belief that food is "to fill the stomach" rather than to help a child grow.

The transactional nature of care

A primary influence on maternal decisions about foods to reoffer to their child after the food had been rejected once was the reaction of the child to the food. While mothers differed in their statements of how soon they would re-offer a new food that had been rejected by their child, it was clear that the child's reaction was important in the decision-making process. Women did not see any advantage to preparing and trying to feed their child foods that he or she rejected because of the taste or consistency. Women also reported that if their child rejected a certain food, they would have to prepare something else (usually a gruel) to feed the child, and that this was a time-consuming process. It is possible that one of the reasons the sweetened rice gruels are so widely used is that it was uniformly accepted by infants. Feeding children green vegetables and khichuri appeared to take more persistent feeding on the part of the mother.

Discussion

Feeding practices

We have shown in this study that prelacteal feeding is still widely practiced in rural Bangladesh, in spite of numerous breastfeeding programmes. However, the feeding of prelacteals is not done by the mother, and it is possible that targeting mothers alone to change this behaviour will not be effective. Exclusive breast-feeding is almost negligible and giving water after breastmilk or during the child's bath is a deeply ingrained practice. Also, early complementation with low nutrient-dense starchy gruels is a serious concern; if breast-milk insufficiency (perceived or real) is indeed a reason then further research is needed to understand this phenomenon better, with an emphasis on understanding the psychological, physiological, and possibly nutritional reasons for it.

We have also found that introduction of rice-based meals was delayed for a majority of children to after 12 months of age and that the belief system around not giving rice before 12 months is strong. However, mothers were willing to feed their child the highly promoted local complementary food, and modifications to the way in which khichuri is promoted could increase its use as a complementary food. Media messages related to khichuri were widely seen and heard but comprehension is a problem.

Feeding frequencies were low and children were fed mainly at adult mealtimes. Also, feeding appeared to be mostly passive in that foods are given (or even cooked) only when children cry from hunger. While this is an appropriate response for young children (e.g., breast-feeding on demand), one would expect that with older infants and young children, mothers would be more proactive in initiating feeding episodes with the aim of ensuring frequent and adequate food consumption.

Influences on feeding practices

Our study indicates that women juggle a variety of influences in the process of making decisions about what to feed their young children, when and how to feed these foods. These factors are laid out in Figure 4 in a revised framework that elaborates on the steps that lead to the final decision about foods that are offered to children. According to this framework, women obtain information on infant care and feeding from a number of sources, for example, from television and radio messages, books, and most importantly from the older, more powerful members of their households, e.g., mothers-in-law, mothers and other older women. Other sources of advice were doctors and community health workers. The information from all these sources is then evaluated in light of the women's own knowledge, confidence, and the choices that are available to her.

Household food availability was a key determinant of the types of foods that mothers were able to feed their young children. Household food purchasing was done predominantly by men mostly according to their perceptions of family needs. Snack foods (biscuits, a spicy fried lentil mix, candies) were bought for the child by fathers, uncles, grandfathers, often from when the child was about 6 mo old. These foods were often fed to the infants by other household members (other children, fathers, grandfathers, etc.), and there was little maternal control over this practice.



Figure 4: Revised model of decision-making about infant feeding

Another important, and hitherto not well studied, influence on maternal feeding decisions was the reaction of infant itself. In this study, mothers reported basing their decisions about introduction of complementary foods on infant behaviours such as persistent crying. Also, decisions about what foods to continue to offer to infants after a first trial were often based on maternal interpretations of their infants' reactions. While the theoretical understanding of the transactional nature of child care is well

188

developed (8), the research on understanding the nature of these relationships is still slow in coming. There is some evidence that mothers alter their feeding patterns based on child illness (9), child appetite, health and nutritional status (10-13). However, more work is needed to deepen our understanding of the process of the development of these relationships. More importantly, programmes that address feeding behaviours will have to develop methods to help young mothers understand and deal with infant reactions to changes in their feeding behaviours.

Methodological issues

Although this study is a small in-depth qualitative study, we believe the results are generalisable to similar rural Bangladeshi population groups that have not been exposed to intensive health education programmes. Throughout the course of the study, the preliminary findings were discussed in peer-debriefing sessions with other researchers working in the area of infant feeding practices in Bangladesh. Also, the findings of our study concur well with the patterns of infant feeding seen in the Bangladesh DHS data sets (specifically, prolonged breast-feeding, delayed introduction of regular complementary foods) as well with other studies done in Bangladesh in the recent years (2, 14).

This study design does not enable us to make statistical comparisons of different groups, but it is useful to characterize patterns of childcare and to generate hypotheses related to the determinants of childcare practices and child health. Most importantly, it permits a deeper understanding of the complexities of decision-making about infant feeding and care practices.

Conclusions

Effective behaviour change messages and interventions should target different individuals in a household (particularly older women and fathers, in addition to mothers) in order to ensure that all household members are well informed about the importance of appropriate infant feeding and care practices. However, the availability of adequate resources at the household level is essential to allow the translation of knowledge into good nutritional outcomes for children. Also, programmes that intend to promote appropriate infant feeding practices should consider the importance of providing support for dealing with infant feeding problems in addition to providing information about appropriate infant feeding practices to caregivers.

References

- 1. Ahmed S, Parveen SD, Islam A. Infant feeding practices in rural Bangladesh: policy implications. *J Trop Pediatr.* 1999;**45**(1):37-41.
- 2. Haider R, Kabir I, Ashworth A. Are breastfeeding promotion messages influencing mothers in Bangladesh? Results from an urban survey in Dhaka, Bangladesh. *J Trop Pediatr.* 1999;**45**(5):315-8.
- 3. Menon P, Habicht J-P, Zeitlin M. Maternal caring behaviours mediate the influence of maternal schooling on child nutrition in rural Bangladesh. *FASEB J*. 1999;**13**(5):A878.
- 4. Dickin K, Griffiths M, Piwoz E. Designing by Dialogue. A Programme Planners' Guide to Consultative Research for Improving Young Child Feeding. *Washington DC: Manoff Group & The Academy for Educational Development*, 1997.
- 5. Muhr T. ATLAS/ti. Berlin, Scientific Software Development, 1997.
- 6. SPSS I, SPSS Reference Guide, SPSS Statistical Data Analysis. Chicago, IL, SPSS, Inc., 1990.
- Dettwyler KA. Infant feeding in Mali, West Africa: variations in belief and practice. Soc Sci Med. 1986;23(7):651-64.
- 8. Engle P, Menon P, Haddad L. Care and Nutrition: Concepts and Measurement. *World Dev.* 1999;**27**(8):1309-1337.
- Marquis GS, Habicht J-P, Lanata CF, Black RE, Rasmussen KM. Association of breastfeeding and stunting in Peruvian toddlers: an example of reverse causality. *Int J Epidemiol.* 1997;26(2):349-56.
- Piwoz EG, Black RE, Lopez de Romaña G, de Kanashira HC, Brown KH. The relationship between infants' preceding appetite, illness, and growth performance and mothers' subsequent feeding practice decisions. Soc Sci Med. 1994;**39**(6):851-860.
- 11. Simondon KB, Simondon F. Infant feeding and nutritional status: the dilemma of mothers in rural Senegal. *Eur J Clin Nutr.* 1995;**49**(3):179-88.
- 12. Simondon KB, Simondon F. Mothers prolong breastfeeding of undernourished children in rural Senegal. *Int J Epidemiol.* 1998;**27**(3):490-4.
- Simondon KB, Costes R, Delaunay V, Diallo A, Simondon F. Children's height, health and appetite influence mothers' weaning decisions in rural Senegal. Int J Epidemiol. 2001;30(3):476-81.
- 14. Kimmons JE, Dewey KG, Haque E, Chakraborty J, Osendarp S, Brown KH. Development of Improved Complementary Foods and Feeding Practices in Rural Bangladesh. Report submitted to ICDDR,B, *Dhaka, Bangladesh*, 2000.
- 15. Lutter C (in press). Breastfeeding promotion: Is its effectiveness supported by scientific evidence and global changes in breastfeeding behaviours? Short and long term effects of breastfeeding on infant health. B. Koletzo, H. O and K. Michaelsen. *New York: Plenum Press.*

THE RELATIONSHIP BETWEEN WEALTH AND MALNUTRITION IN THE HIGHLANDS OF ETHIOPIA

Arabella Duffield¹, Tayech Yimer¹, Kiros Tefera¹, Anna Taylor¹

Introduction

The importance of care in the causality of malnutrition is now widely recognized. Care includes both caring practices i.e. behaviours which have an impact on child nutritional status such as care for women, infant and young child feeding, hygiene practices and health seeking behaviour and caring capacities which are determined by caregivers' access to economic and human resources (1).

Much of the investment in large scale, long-term nutrition programmes is now focussed on addressing the care components of the causes of malnutrition. For example, the Ethiopian Government is planing to start a community growth promotion programme in selected areas of the country shortly. This programme aims to educate mothers about caring practices through community based growth monitoring and hence improve the growth of young children. While the importance of poverty as a basic cause of malnutrition is recognized, intervening at household and community level to change caring behaviour is regarded as a sustainable and effective way of realizing impacts on malnutrition in the immediate term and before poverty reduction can be achieved.

SC-UK recognizes that there is evidence to suggest that certain communities in Ethiopia employ caring practices, which do not optimize child nutrition. For example the recent DHS survey (2000) showed that only 32% of infants born in Amhara were breastfed within one hour of birth and only 54% of women reported knowledge of ORS packets (2).

There is little evidence, however, to show that intervening at household and community level to change caring behaviour through growth promotion improves nutritional status in Ethiopia. SC-UK is concerned that the relationship between caring practices and the economic and human resources to which households have access has been overlooked. We believe that investigating this relationship

¹ Save the Children UK

will allow decisions on how to spend resources earmarked to improve caring practices can be better informed.

The study described in this paper is part of a wider body of work undertaken by SC-UK in Ethiopia which aims to assess current caring practices in the highlands, understand the reasons behind the caring practices observed and identify possible interventions which could improve caring practices. The objective of the research described here was to determine the extent to which caring practices, malnutrition, morbidity and caregiver's knowledge are associated with socio-economic status as defined by the community within the project site. The work described here is quantitative – questionnaires were applied to households. Later work will be more qualitative and seek to find explanations for the findings of the quantitative assessment.

Method

Site selection

The study was undertaken in the woina-dega² areas of Gubalafto woreda³, North Wollo Zone in Amhara Region. The woina-dega communities in the North Wollo East Plain live between 1,500-2,200 metres and are dependent on rain-fed agriculture. Land holdings in this area are very limited. Most households own between 0.5-1.0 ha of land (average household size is 5) (SC-UK – North Wollo East Plain Food Economy Zone, 1999).

The woina-dega areas of Gubalafto were selected as the study site for several reasons. The most important is that the population living in this area is relatively typical of Wollo zone; they are not living in either the extreme high or low land. In addition, SC-UK has worked in Gubalafto for many years and currently has an office in Woldiya (the woreda centre). SC-UK has undertaken two food economy assessments in the woreda and our Nutritional Surveillance Programme systematically collected anthropometric and early warning data in this area for many years (SC-UK – North Wollo East Plain Food Economy Zone, 1999, SC-UK The results of community surveys in North and South Wollo, 1995).

Sampling

This study was not intended to be statistically representative of the areas studied. The purpose was to assess differences by

² Woina-dega areas lie between 1,500 and 2,500m above sea level.

³ The total population of Gubalafto woreda was estimated at 160,000.

wealth group in selected Peasants Associations (PAs)⁴ which were representative of the agro-ecological zone. Households in the selected PAs were exhaustively sampled. Households with children under two were found by going from house to house in every village. A detailed local calendar was used to assess age.

Sample size calculations were based on the following equation (3):

$$N = \frac{\{u\sqrt{[\Pi_1(1-\Pi_1) + \Pi_2(1-\Pi_2)]} + v\sqrt{[2\Pi(1-\Pi)]}\}^2}{(\Pi_2 - \Pi_1)}$$

where,

- N = sample size for each group
- Π_1 = proportion in first group
- Π_2 = proportion in second group
- U = one sided percentage point of the normal distribution corresponding to 100% - the power, for example if power = 90%, (100% - power)=10% and u=1.28
- V = percentage of the normal distribution corresponding to the required (two-sided) significance level, for example if significance level = 5%, v=1.96

$$\Pi = \frac{(\Pi_2 + \Pi_1)}{2}$$

Based on previous SC-UK estimates of wealth groups in the study area, it was estimated that 1,500 children should result in 263 better-off children, 525 medium children and 712 poor children (SC-UK – North Wollo East Plain Food Economy Zone, 1999). This sample size allowed demonstration of a 10% difference in the prevalence of malnutrition between each wealth group assuming there is a dose response relationship. Tests for trends in mean measurements require smaller sample sizes and hence the sample allowed us to detect smaller changes between mean anthropometric indices for the different groups.

Variables

Using participatory rural appraisal (PRA) techniques key informants, (village leaders, teachers, health staff, women's group leaders and other groups' representatives) identified different wealth groups in their community and defined the criteria for inclusion in each group. The wealth definitions included criteria related to asset

 $^{^4}$ A peasants association (PA) is the smallest administrative unit recognised by the Government of Ethiopia. The population of the PAs in this study range from 5-6,000.

ownership, access to food, household composition, expenditure and income.

Having agreed the major characteristics of each wealth group, key informants then accompanied SC-UK's data collectors to each household in order to discreetly identify its wealth status according to the predefined criteria. One key informant was responsible for identifying the wealth group of about 50 households.

Anthropometric measurements and clinical measurement of oedema were taken of all children under two years. A structured, pre-coded questionnaire was applied to the primary caretakers of the children. If either the primary caretaker or the child was not available at the first visit the team returned to the household later.

The questionnaire included questions on household characteristics, infant feeding practices, hygiene, health status, health seeking behaviour, vaccination status and maternal knowledge of hygiene, health and feeding practices. Maternal MUAC, age and pregnancy status was also recorded. The questionnaire was based on SC-UK's previous experience with health education in the area (SC-UK- The results of community surveys in North and South Wollo, 1995). Wherever possible questions and indicators were consistent with international recommendations (4, 2).

The questionnaire was field tested in advance of the study and modified where appropriate.

Data analysis

Data were entered, cleaned and analyzed in EpiInfo 6.04b-c upgrade. EpiInfo was used to calculate anthropometric indices. Flagged records (n=29) were excluded from further analysis.

A maternal knowledge score was created from the six questions concerning mother's knowledge of hygiene, health and feeding practices. The score ranged from 0-6. The mean score was 3.2. This score was later divided into two – women with good knowledge scoring correctly on at least three of the questions and those with poor knowledge correctly answering less than three questions.

Proportions were entered into contingency tables and associations analyzed using Chi-squared. Where relevant the Mantel-Haenszel chi-squared test, and chi-squared test for trend were applied. Further analysis assessed the relationship between wealth groups and outcomes using multiple and logistic regression.

Results

Wealth ranking

The results of the community's wealth ranking exercise were almost identical to those obtained by SC-UK in previous studies in the area (SC-UK – North Wollo East Plain Food Economy Zone, 1999). The most important factor identified for the better-off group was the ownership of at least one pair of oxen. Medium households were identified by having one ox and some other large livestock. The poor, apart from not owning any large livestock themselves, also included households without land, or households where the head was disabled, incapacitated or old and without support.

Table 1: Defining characteristics of wealth group as identifiedby the community

Assets	Better- off	Medium	Poor
Oxen	2	1	-
Cows	2	1	1 (yerbee)
Calf	0-1	0-1	1 (yerbee)
Hefer	0-1	-	-
Sheep	2-3	1	2-3 (yerbee)
Goat	2-3	1	2-3 (yerbee)
Donkey	1	1	-
Chicken	3	3	3
Other			Involved in yerbee (looking after
characteristics			other HH's animals)
			Rent out their land and labour to
			richer HHs
			 Contract their land on annual
			basis
			Involved in daily labour and
			selling firewood
			Landless HH
			HH with disabled heads

Oxen are extremely important in this community as they allow a household to plough their land. Households who own only one ox must pair up to plough their land. Households who do not own any oxen must rent them of other households. Payment for the rental agreement is usually about 50% of the harvest yields. Thus the better-off groups receive not only their own harvest but a proportion of other households' harvests too. The poorer groups, however, are often unable to obtain sufficient food to feed themselves given that land holdings in the area are so small and that they have to give so much away (SC-UK – North Wollo East Plain Food Economy Zone, 1999).

190

SC-UK's food economy studies have found that better-off households have different diets, income and expenditure than poorer households. The poor households in Gubalafto are normally dependent on food aid for 25% of their food needs in an average year, whereas the better-off are able to obtain enough food for their needs. Previous research has also shown that poorer households have less money to spend on education, clothing, health care, food and other essential purchases (SC-UK – North Wollo East Plain Food Economy Zone, 1999; SC-UK – Assessment of the impact of food aid on household food economies in North Wollo, South Wollo and East Haraghe, Ethiopia, 02/2000, 11/2000).

Malnutrition and age

Graph 1 shows the relationship between malnutrition (<- 2 zscores weight for age) and age. The relationship between malnutrition and age in the study population is typical of much of the developing world and very similar to the pattern seen in the recent Ethiopian DHS (2). The prevalence of malnutrition appears to level out at 41% at about 12 months. This rate of low WAZ is actually lower than the prevalence estimated in the DHS for Ethiopia as a whole. The fact that the survey was conducted at a time when food was readily available to most of the population may account for this.

Graph 1: The relationship between age and malnutrition (defined as <-2 z-scores weight for age)



The overall prevalence of low WAZ (<-2 z-scores) was only 3.2% up to the age of six months. A large increase in the proportion of low WAZ children is seen between 6 and 10 months. This is the time when complementary foods should be introduced to the children's diets. Our results indicate that a relatively high proportion of women delay introducing complementary foods to their children until after six months in Gubalafto. Up to 20% of children are only receiving breastmilk until 10 months. However, this is also the time when children begin to crawl, and an analysis of the children in the 6-10 age group reveals that diarrhoea in the 24 hours prior to interview is the only factor significantly associated with the risk of malnutrition at this age.

Given the rise in malnutrition between 6-10 months, it is important that SC-UK and other agencies working in the area focus their efforts on improving the status of children at this age.

Malnutrition and breastfeeding

	Prevalence of moderate low	Significance of chi-square	Prevalence of severe	Significance of chi-square
	WAZ	test (p)	low WAZ	test (p)
Exclusively	1.9%	< 0.01	0%	< 0.01
breastfed (n=312)				
Not exclusively	9.0%		4.5%	
breastfed (n=67)				
Predominantly	1.7%	< 0.01	0%	< 0.01
breastfed (n=349)				
Not predominantly	20.0%		10%	
breastfed (n=30)				

Table 2: The prevalence of low WAZ according to breastfeeding
pattern in children less than six months old (n=379)

Until the age of six months most of the children appear to be protected by breastfeeding. Those who were not predominantly⁵ breastfed were significantly more likely to be both severely and moderately malnourished than those who were. Exclusively⁶ breastfed children were also less likely to be malnourished than non-exclusively breastfed children.

⁵ Infants who are breastfed but also receive water, water-based drinks (sweetened or flavoured water, teas, infusions), fruit juice, or oral rehydration salts solution are defined as predominantly breastfed. No other liquids (including animal milks) or solids are allowed in this definition (4).

⁶ Infants who are only given breastmilk are defined as exclusively breastfed (4).

Almost ninety percent of the women interviewed for the survey predominantly breastfed their children up to age 6 months. However, significantly less mothers were exclusively breastfeeding after 3 months. Exclusive breastfeeding depends not only on a mother knowing that exclusive breastfeeding is best, but also on her being able to be with her child for enough hours a day to provide breastmilk continuously. Our results show that women who spent more than two hours away from their child were significantly less likely to exclusively breastfeed their children under six months than those who spent less time away from home (p<0.001). No relation between length of exclusive breastfeeding and knowledge of when to start complementary feeding exists in our data set.

Wealth and nutritional status

Table 3:	Means	(and	standard	deviations)	of	anthropometric
	indices	by w	ealth grou	p in children	ı ag	ed 6+ months

	Better-	Mid	Poor (n=540)	All children	Significance
		(11-374)	(11-349)	(11-1046)	of test for
	(n=125)				trend (p)
WAZ	-1.557	-1.865	-1.871	-1.831	
	(0.810)	(0.971)	(1.056)	(1.005)	0.01
WHZ	-0.666	-0.861	-0.969	-0.895	
	(0.580)	(0.850)	(0.829)	(0.903)	< 0.01
HAZ	-1.618	-1.840	-1.779	-1.782	
	(1.383)	(1.439)	(1.648)	(1.543)	0.38









Table 3 and graphs 2 and 3 show that wealth is significantly associated with malnutrition in children aged 6-24 months. There is 10% difference in the prevalence of low WAZ (both severe and moderate) between the better-off group and the medium or poor groups. There is more than a three-fold difference in the prevalence of low WHZ between the better-off and poor groups. In fact, less than 2% of the better-off children are wasted.

The relationship between wealth group and stunting is not significant, although the direction of the relationship is the same as that described for WAZ and WHZ, i.e.: children living in richer households have higher mean nutritional status.

Wealth and health status

Table 4 shows that among children aged more than six months, the wealth of the household is significantly associated with children's illness in the 24 hours prior to interview as reported by caregivers. Better-off households were less likely to report that their children had been ill in the past 24 hours.

	Better-off (n=122)	Mid (n=371)	Poor (n=543)	All HH (n=1036)	Significance of difference between rich and other groups (p)
Child had any illness in past 24 hours	24%	32%	32%	31.0%	0.01
Household has soap	61%	38%	40%	42%	<0.001
Household use soap more than once a week	52%	52%	31%	33.0%	<0.001
Child drank milk in past 24 hours	32%	23%	15%	20%	<0.001
Mother attended school	30%	21%	21%	22%	0.02

Table 4: Relationship between wealth and other characteristicsin children aged more than 6 months (proportionsshown), chi-squared tests

Wealth and other factors

A number of other factors that could influence nutritional status and illness in children were also associated with wealth in this study. These included hygiene practices, feeding practices and educational status of caretakers. Households that were better-off scored more highly on all of these factors (Table 4). For example, better-off households were significantly more likely than poorer households to have a bar of soap in their home and also to use soap at least once a week. Additionally, children aged more than 6 months in better-off households were more likely to have drunk cow milk in the 24 hours prior to interview. The caretakers in better off households were significantly more likely to have been to school and to be able to read. They also scored significantly higher on the knowledge tests than medium or poor groups (Table 5).

	Better-off	Mid	Poor	All	Significance
	(n=122)	(n=371)	(n=543)	children	of test for
				(n=1036)	trend (p)
Maternal	3.7	3.2	3.2	3.3	< 0.01
knowledge score	(1.1)	(1.2)	(1.3)	(1.3)	
(0-6 points)					
Number of people	6.3	5.5	4.5	5.1	< 0.01
living in the HH	(1.6)	(1.6)	(1.5)	(1.7)	

Table 5: Relationship between wealth and other characteristics in children aged more than 6 months (means shown), chi-squared tests

A further characteristic of better-off households was that they were significantly larger (Table 5). This could indirectly affect children's nutritional status in several ways. Firstly, more labour is available in the household allowing more people to work off the farm and obtain additional income. Secondly, if a household is larger it may mean that caretakers have additional assistance in looking after young children. For example, a mother in a larger household may be able to send someone else to collect water or go to the market rather than do it herself. This could result in her spending more time with her child. However, larger household sizes may also negatively affect nutritional status: more people means more overcrowding and more mouths to feed. In general, however, household food economy studies have shown that households with more labour are better-off (SC-UK - North Wollo East Plain Food Economy Zone, 1999; SC-UK - Assessment of the impact of food aid on household food economies in North Wollo, South Wollo and East Haraghe, Ethiopia, 02/2000, 11/2000).

Nutritional status and other factors

Table 6 shows that children aged more than 6 months who were reported to have been ill in the 24 hours prior to interview were more likely to be malnourished than children who were reported to be healthy. Given the cyclical nature of the association between malnutrition and illness this finding is unsurprising (5).

During initial analysis, using chi-squared tests, in children aged more than 6 months low WAZ was associated with several factors other than age, illness and wealth. These included soap ownership and use and mother's education. Mother's maternal knowledge score was not associated with malnutrition, nor was drinking animal milk or household size.

	Ν	Prevalence	Significance of
		of low WAZ	chi square test
			(p)
No illness	719	38.7%	0.005
Illness	317	47.9%	
Did not attend school	808	43.4%	0.02
Did attend school	227	34.8%	
Have soap	434	38.0%	0.05
Do not have soap	602	44.0%	
Use soap more than once a week	357	36.1%	0.02
Do not use soap once a week	679	44.3%	
Child drank milk in last 24 hours	208	37.1%	0.14
Child did not drink milk in last 24 hrs	828	42.6%	
Mother scored highly on knowledge test	444	41.9%	0.90
Mother scored less well on knowledge test	578	41.5%	

Table 6: Relationship between nutritional status and other factors in children aged 6 months or more, chisquared tests

Multiple regression analyses

Table 7: Results of the multiple regression analyses.Coefficients and (p-values) shown, n= 1035

	Age of	НН	Maternal	Maternal	Child's	Use soap	Drink milk	WAZ
	child	Wealth	schooling	know-	illness	(0= do not use	(0-6	
	(months)	(1=rich,	(0 = no	ledge score	(0= not ill,	once per	number of	
		2=medium,	school,	(0 to 6)	1 = ill)	week, 1= use)	times drink	
		3=poor)	1= school)				milk	
							yesterday)	
WAZ	-0.015	-0.111	0.218	-0.040	-0.187	-0.049	0.002	
	(0.006)	(0.013)	(0.005)	(0.112)	(0.005)	(0.465)	(0.950)	
WHZ	-0.054	-0.117	0.191	-0.030	-0.114	0.120	0.038	
	(<0.001)	(0.002)	(0.004)	(0.159)	(0.047)	(0.036)	(0.240)	
HAZ	0.000	-0.055	0.117	-0.022	-0.176	-0.044	-0.041	
	(0.988)	(0.328)	(0.228)	(0.480)	(0.036)	(0.603)	(0.379)	
Illness	-0.009	0.036	0.022	0.012		-0.090	0.013	-0.040
	(<0.001)	(0.086)	(0.532)	(0.312)		(0.004)	(0.445)	(0.005)
Feeding	0.000	-0.136	0.141	0.038	0.030			
milk	(0.923)	(<0.001)	(0.027)	(0.066)	(0.583)			
Use of soap	0.000	-0.044	0.147	0.063				
	(0.854)	(0.036)	(<0.001)	(<0.001)				

Table 7 shows the results of multiple regression analyses. Child's age, wealth group and maternal education remained significantly associated with WAZ and WHZ in multiple regression analyses. These variables are probably determinants of child malnutrition in this community. Illness also remained associated with poor nutritional status in multiple regression analyses, but given the cyclical nature of the association between illness and health it is not possible to state whether illness determines malnutrition or vice versa.

In the multiple regression analysis WAZ was not associated with any hygiene practices, however improved WHZ was associated with using soap. It is possible to speculate that the use of soap reduces the risk of diarrhoea and hence impacts on nutritional status in this way.

The associations between feeding milk and the use of soap with wealth group and maternal schooling also remained during multiple regression analysis.

Discussion

The results described above are not complete because they represent the findings only of the quantitative survey. The qualitative survey should provide explanations of many of the findings described in this paper. Thus it is stressed that the discussion and recommendations presented below are preliminary only.

For children under six months, it seems that the most important factor associated with malnutrition is breastfeeding pattern. Our results indicate that the most important determinant of whether or not a child is exclusively breastfed is how long the mother spends away from the child. SC-UK needs to find ways to enable women to practice exclusive breastfeeding up to 6 months in terms of both education and time.

Above the age of six months, the wealth of the household is significantly associated with children's' illness status, feeding and hygiene practices in the household. This implies that wealth is an important determinant of the basic causes of malnutrition in Gubalafto. We feel that this is an important finding. Most of the previous work looking at the associations between malnutrition and poverty has looked at the relationship across different communities rather than within one community.

Our findings suggest that wealth affects many different facets of malnutrition and thus it will be important to consider the differences between wealth groups during any intervention to improve nutrition. Given that the vast majority of the households in this area are defined as poor or medium (80%), programmes aiming to improve the nutritional situation of this community must look carefully at interventions that can improve the situation for these groups, not only the better-off. Poorer groups may not benefit from health, nutrition or hygiene education if they cannot afford to carry out the advice. It may be necessary to provide inputs to these groups in order that they can improve their situation.

One example is hygiene. Poorer households own and use less soap than richer households. Soap helps to prevent diarrhoea and hence malnutrition. Education around soap use may be useless if poor households simply cannot afford to buy it. Similarly, buying, or even making, ORS is not always possible for the poorest households. On the other hand, encouraging women to continue to breastfeed when their child has diarrhoea should be effective for all wealth groups.

Mother's educational status is also associated with child's nutritional status, illness, feeding and hygiene practices in the household independently of wealth. This result reflects macroresearch from other parts of the world (6). Interestingly, the maternal knowledge score was not directly associated with nutritional status, although the score was associated with the mother's educational status. We speculate that formal maternal schooling empowers women more than just giving them knowledge, possibly by allowing them to make more decisions in the household etc.

In conclusion, the results of this study indicate that both wealth group and maternal formal education play are strongly associated both with malnutrition and some of the causes of malnutrition. Thus we would support programmes providing formal education to women from all wealth groups. Given that wealth is mainly defined by food security in this community, it is clear that improving food security should be a priority for any agency wishing to improve the nutritional situation of children in this community.

References

- 1. UNICEF. The Care Initiative. New York, 1997.
- 2. Central Statistical Authority. Ethiopia demographic and health survey 2000. *Addis Ababa*, 2001.
- 3. Kirkwood BR. Essentials of medical statistics. Blackwell Science: Oxford, 1988.
- Lung'aho M, Huffman S, Labbok MH, Sommerfelt E and Baker J. Tool kit for Monitoring and Evaluating Breastfeeding Practices and Programmes. Wellstart International: Washington DC, 1995.
- 5. Tomkins A and Watson F. Malnutrition and infection: a review. ACC/SCN State of the Art Series, Nutrition Policy Discussion Paper, No. 5. 1989.
- 6. Smith L and Haddad L. Overcoming child malnutrition in developing countries: past achievements and future choices. Food, Agriculture and the Environment Discussion Paper 30. *IFPRI*, 2000.

CHILD-CENTRED CARE IN AFRICAN HEALTH CARE SYSTEMS: WHY IS THERE SO LITTLE OF IT? AND WHAT CAN BE DONE?

Pierre Blaise¹, Guy Kegels¹, Bart Criel¹

Introduction

Today, in many African countries the issue of quality of care at the level of modern First Line Health Services (FLHS) - public or private - is prominent. Huge efforts have been deployed in the eighties and nineties to 'revitalize' African primary health care systems. At the level of the first line, the focus has been on arrangements ensuring the provision of the necessary inputs (human, drugs, equipment, etc.) in the health care delivery process and, at the same time, on the rationalization of health care delivery in facilities staffed by auxiliary health workers (1). The sustainability of these policies benefited from the introduction of community financing schemes based on user fees, and on the management of these funds by local health committees. The Bamako Initiative (BI) launched in 1987 by the African Ministers of Health, the World Health Organization (WHO) and the United Nations Children Fund (UNICEF) has without doubt contributed to positive achievements in this domain (2). The operational integration in first line health services of preventive and promotional activities for mothers and children - the Expanded Immunization Programme (EPI), Antenatal Care (ANC) and Well Baby Clinic (WBC) including growth monitoring (GM) - was central in this strategy. Improvements were achieved in the accessibility of health care, in the range of services offered, and in the availability of essential drugs (3).

But today there is a standstill, sometimes even a frank decline, in utilization rates of modern FLHS. The coverage rates of preventive services remain low and the utilization rates of curative services hardly go beyond 0.3 contacts per year per inhabitant in many first line health services, even in 'revitalized' ones. Although there is no such thing as a golden standard when it comes to measure appropriate levels of utilization, these low levels indicate that there is a major problem in accessibility and acceptability of health care. The immunization rates increased sharply over 50%

¹ Department of Public Health, Institute of Tropical Medicine, Antwerp

but the further increase required to achieve an epidemiological impact is much more difficult to obtain. In the Well Baby Clinic, the over-concentration on measurable targets, justified by a concern for efficiency, has sometimes led to poorly effective rituals. The number of health education sessions held, and thus the number of supposedly well-informed mothers has increased. So did the number of children undergoing regular weighing, at least until the age when they are fully immunized. But the outcome of these activities remains far below expectations (4). To add to this balancing view, there also is a growing concern for equity. There is increasing evidence that the poor have less access to essential services although they are the ones most in need.

A question therefore emerges: why is it that the population is increasingly ignoring these health services? What is happening? Why does the model of the "integrated health centre" not attract people? There is growing evidence pointing to problems in the human interaction between health workers and patients. The increase in the availability of primary health care services was not accompanied by an improvement in the quality of care offered. Evaluations and studies indicated that health services are often seen as hostile and aggressive vis-à-vis patients (5). If patients are given the opportunity to express their feelings, they say that they feel not listened to or heard. They feel that their views and opinions, their own explanations of what happened to them is not sufficiently taken into account (6). They claim that they are not seen as subjects, but rather as an object in a process that offers standardized responses to their complex individual problems. Sometimes, they even claim to have been the victim of aggression, insults and maltreatment. The question health services all over the world, both in the developing as in the industrialized world², need to address is what needs to be done to (re)situate the patient back at the very heart of the health services.

This paper presents an attempt to answer this question. We will concentrate on child health care and analyze the lack of childcentred care observed in African modern FLHS along three lines: i) the dimension of the clinical method that is practiced; ii) the dimension of the organization of health services and programmes; and iii) the dimension pertaining to the social and anthropological environment in which children, mothers and staff interact. In a first part we will introduce the concept of child-centred care. In a second part we will review the gaps between what is being practiced and

² The increasing success of alternative forms of health care witnessed in industrialised countries points to a lack of patient-centredness within the prevailing classical forms of health care delivery.

what would be a child-centred WBC. In a third part we will propose a comprehensive strategy to move towards a more child-centred approach.

What is going wrong? Lack of child centred-care

A lack of patient-centredness in child care is at the heart of the problem of quality of care

Patient satisfaction surveys indicate that public health services are often seen as delivering poor quality of care (7): a key element in that perception is the users' dissatisfaction with the quality of the interaction between health worker and patient -also in situations where medical doctors staff the first line (8). The clinical consultation is indeed often conducted as a mechanistic process in which the patient is hardly listened to, and where her/his problem is purposely reduced to one or more physical complaints leading the health worker in charge to standard decision-making. Alongside the call from WHO for more responsive health services, efforts are currently being deployed to improve the overall quality of the patient-health worker interaction (9). These efforts tend to focus on (important) aspects pertaining to communication skills and practices, to attitudes of kindness, respect, and compassion vis-à-vis the patient, as well as on more down-to-earth issues like cleanliness of buildings and offices. This is laudable indeed, but not sufficient. Quality of interpersonal care cannot be merely reduced to solely increased patient satisfaction through better communication. Concentrating only on these aspects would constitute a missed opportunity for needed profound changes in the process of clinical care itself. Indeed, the emergence of the problem represents a unique opportunity to integrate the patientcarer interaction within a genuine patient-centred clinical method. Good communication per se is not an end in itself, but should be seen as part of a larger methodological process of patient-centred care where the patient is considered in her/his wider psychological, social, cultural and economic environment.

Indeed, a clinical method centred on the patient is not only more humane and acceptable, but would at the same time yield better results and be more effective. First line health services would also benefit greatly from this approach because they are the place where the initial contact takes place between health services and population; between professionals and patients (or potential patients) and their health problems. Moreover, it has a universal dimension. It would be a mistake to think that this is a luxury reserved for private institutions accessible to the privileged, or for rich countries. But what exactly is meant by a clinical "patient-centred" method?

Patient-centred care: a genuine clinical method

Patient-centred care and thus also child-centred care is a concept which brings five key dimensions at the heart of health care activities: 1) a bio-psychosocial perspective; 2) the patient as a person; 3) the doctor as a person; 4) sharing power and 5) responsibility and the therapeutic alliance (10).

What is a patient-centred clinical method?

In the classical 'biomedical' approach, which is still the most prevalent approach in medical schools and teaching hospitals of industrialized countries, the task of the health worker consists in interpreting, decoding and translating symptoms and syndromes and to categorize the 'crude' complaints expressed by the patient under well-known nosological entities. Eventually, a course of action to be taken is proposed. The health professional thus follows a sort of sorting procedure leading to a diagnosis. He discards whatever is not relevant to his decision-making process. The dialogue, generally led by the health worker, consists of asking precise and generally closed questions in order to obtain further information which is not spontaneously given and which is necessary to his train of thought. He can then come to a diagnosis and propose a treatment. He even may conclude that there is an absence of pathology. In that case, the health worker can reassure his patient and explain him that there being no explanation for the pains, there is no need to worry. Of course, in spite of the sometimes 'police questioning' style this approach is not contradictory with a respect for the patient's dignity, nor with a sense of compassion. Moreover, a kind and respectful attitude and a sense of communication on the part of the health worker contribute - this has been proven - to a better compliance. But a genuine patient-centred clinical method goes in fact a lot further than that.

In the domain of family medicine, Michael Balint first introduced the concept of a "patient-centred clinical method". It was then further conceptualized by Mc Whinney (11,12) and also applied in a South African context to the postgraduate training of family practitioner specialists (13,14). The technique is based upon the health worker 's identification of *clues* offered by the patient during the history taking or the clinical examination. These clues are seen as opportunities for the patient to express all the dimensions (physical, psychological and social) of his problem. This is useful for himself as well as for the provider who will integrate all this information in his clinical reasoning.

During this process, the health worker tries to acknowledge and explore the different clues offered by the patient. He/she facilitates the discussion through open questions being as little directive as possible. In this way he/she can come to a more in-depth assessment of the problem. The aim of this interactive assessment is not to find a diagnosis but to come to a three stage assessment of the problem: i.e. a clinical level (the symptoms), a personal level (the patient's experience), and a contextual level (the interaction between the patient, his health problem, and his environment). This mutual assessment will eventually lead to a plan negotiated between the health worker and the patient. This plan often, but not necessarily, includes a therapeutic dimension (Figure 1).

Figure 1: The patient-centred consultation model (adapted from Fehrsen & Henbest 1993)(13)



204

Between the classical biomedical approach and the patientcentred clinical method there is an essential difference. In the biomedical approach, the doctor-patient relationship basically serves the purpose to obtain an optimal participation of the patient in the diagnostic (accuracy of information) as well as in the therapeutic process (compliance). Eventually, it aims to achieve a satisfactory result according to biomedical criteria: that is to restore the patient's good health - the latter being defined by the absence of any apparent disease. The patient-centred clinical method considers the health worker-patient interaction as a facilitating process aiming to improve the understanding of the problem by each of the two actors. A collective negotiation process about a mutually agreeable course of action then follows. These two processes, facilitation and negotiation, are such that they increase the patient's capacity of facing his problem. They put at the patient's disposal, if necessary, further information, skills and resources. This process relates to the concept of 'enablement' developed by Howie (15). Within this model the outcome of the consultation is no longer a diagnosis-treatment strategy, but a re-built capacity of the patient to face his health problem(s). The intended outcome is not cure per se, but rather an overall restoration of the patient's capacity to properly function in his environment according to criteria defined by the patient himself.

A child-centred clinical method: the most important feature for child care to be meaningful

We have highlighted that one of the core elements of a childcentred approach is the importance given to the facilitation of the expression of the mother's agenda. In his paper on routine growth monitoring, Garner states that there is insufficient reliable information to be confident that routine growth monitoring is of benefit to child health. In the same paper, commenting Garner, Davies suggests that an important spin-off of growth monitoring is the opportunity for mothers to ask questions about health issues (4). Bringing these three statements together, one can go on to say that if a well baby clinic, focusing on growth monitoring, is not child-centred, it may very well be irrelevant, if not harmful given the anxiety it may create. Introducing and developing the practice of a child-centred clinical method is thus pivotal if this kind of childcare activities have to remain meaningful.

Proposing an appropriate clinical method is not sufficient, the working environment must also change

It would obviously make no sense to consider the clinical patient-health worker encounter in a perspective where abstraction
is made from the broader environment in which it takes place. Hence the need to take into account the social and cultural aspects of the environment in which patient and health worker interact, the structural features of the health facilities, and the organizational characteristics of the health care delivery process. It is therefore justified, even necessary, to take into account two other dimensions next to the methodological one: a social-anthropological dimension, and a health services' structural-organizational dimension.

The first of these two dimensions concentrates on the social and cultural variables that may limit the patient's demand for, and the health worker's supply of patient-centred care. A patient may indeed not wish the health worker to take into account elements other than strictly somatic ones. The health worker her/himself may also resist engaging in a patient-centred relationship for a variety of reasons. The other additional dimension looks into the structural and organizational environment in which patients and health workers interact. An organizational set-up of health care delivery where activities are disintegrated obviously is not ideal for the implementation of a patient-centred and empathic approach (9). An excessive workload resulting from a poor planning of activities does not facilitate an open attitude both from health worker and the patient. The rigid application of diagnostic and therapeutic instruction also does not open space for participatory negotiation of a shared therapeutic plan.

We believe that the introduction and the promotion of childcentred care is not only a matter of participatory interpersonal communication, but also of its articulation with the process of clinical reasoning in a genuine **child-centred clinical method**. The latter in turn requires an **appropriate organizational environment** and takes into account possible **social & anthropological factors** that hamper or to the contrary foster such child-centred care (Figure 2).

Figure 2: The tripod fostering patient-centred care



206

Why is it going wrong? Organizational, methodological and socio-anthropological problems in the delivery of child care

In this section we will briefly review some of the most important gaps between what is actually the practice of under-fives' care and what child-centred care really would need to be. We will analyze this considering the three above-mentioned perspectives.

Organizational obstacles to child-centred care

The structural environment of the child/mother - health worker interaction is often user-unfriendly

At the core of our definition of child-centred care is the capacity to integrate the "patients' agenda" in its full right in the clinical reasoning of the health worker. The way childcare services are organized in most instances does not foster such an approach. For example: growth-monitoring sessions are often sliced into pieces. One health worker is dealing with registration, another one with weighing, and yet another one with health education, etc. There is a chain-like division of the tasks to be performed for each single clinical case. A health worker, whose main required qualification is to be able to read and write, first registers the baby. Once the baby is weighed, it is taken for the control of its immunization status. Finally a short discussion is held, usually with the nurse in charge of the activity, to enquire about nutrition habits, potential risk factors and possibly prevailing acute disease. Eventually the child is discharged with an appointment for the next visit. It is not exceptional that a problem noticed at one stage of the chain will remain unnoticed at the stage where it should actually be dealt with. Too often, the mother is left with the challenge to make the necessary synthesis and to decide what the appropriate action is to be. It is obvious that this situation is not conducive to facilitate the mother to express her own (and her child's) agenda even if such a task division may appear more efficient in terms of productivity (number of children seen per unit of time).

Another problem that is often raised by patients is the lack of privacy. Most of the WBC activities are carried out with a group of mothers like in the case of education and immunization sessions, again with the rationale of improving speed and efficiency.

There also is a problem of service availability and permanence. Preventive activities like immunization or growth monitoring can readily be organized on a periodical basis. This improves an efficient utilization of staff time and allows maximizing the use of vaccines. This is probably not a problem for populations living close to the health centre as long as information is clearly displayed and communicated but not so for scattered and remote populations. For example: a mother walking many kilometres to attend a curative consultation for herself may simply be requested to come again another day for the immunization of the child she carries on her back. Conversely, a woman coming for the immunization of her child and requesting family planning may be told after waiting a whole day to come again at the next family planning session. Such incidents are unfortunately not rare. They not only constitute a wealth of missed opportunities to improve the efficiency and effectiveness of the health care delivery but they also are missed chances to improve the health services' responsiveness to people's demands and to increase the acceptability of the system as a whole.

There is not only a problem of permanent availability of the service, but also one of stability of staff. High staff turn-over between facilities, but also poor stability of staff in the different activities performed in one single facility (a given person performing immunizations on day 1, but running the curative consultation on day 2) is not conducive for the mothers and health workers to engage in a long term relationship. A mother will refrain from sharing with the health worker a delicate part of her own history if she anticipates having to disclose such sensitive information to different staff members at the occasion of subsequent visits. This represents once more an obstacle for the mother to express her own agenda.

One of the main reasons raised to justify the lack of patientcentredness is the lack of time due to the high workload. It is indeed very common to see long queues in front of health centres, sometimes very early in the morning even long before the doors open. The issue for many people is to arrive early enough to be first in the queue. Yet it is not uncommon to see empty facilities in the early afternoon and evening. There is clearly room to reorganize the intake of patients in order to spread the workload over a full day. Some simple rules to decide whom to see first, the introduction of appointment systems, and more clearly signalled pathways in the facilities could greatly improve the situation. Sometimes apparently disorganized activities may hide well organized systems of bribery (16). In such cases, attempts to reduce waiting times and to rationalize patients' flow within the facility may interfere with staff's own personal interests. Unveiling these "coping strategies" and negotiating acceptable alternative strategies with the staff is crucial if the introduction of change is to be effective (17).

In many countries, the development of health services puts a very strong emphasis on managerial issues. Supervision tends to focus too exclusively on (albeit important) administrative and logistical aspects like the quality of record keeping, the accuracy of the financial accounts or the effectiveness of drug stock control systems. It is common to plan field visits of supervisory teams during the least busy moments of the day so as to avoid "disturbances" by patients. The message that is thereby conveyed to the supervised is that administrative management is more valued than actually interacting with patients. This will certainly not foster the construction of the role model of a supervisor promoting and valuing patient-centred care.

Integrated care is an ill-understood and ill-implemented concept

Integrated care is an important characteristic shaping the quality of the health care delivered at the level of the first line. It has indeed the potential to make health services more user friendly and health care more effective and efficient. But the concept is often ill-understood and/or ill-implemented. A major misconception is that integrated care would be automatically achieved when different types of care (curative care, antenatal care, family planning, care for under-fives, etc...) are offered in one single facility. It is as if the mere existence of different types of care under one single roof would be a sufficient condition for care to be integrated – which is not the case. Integrated care, in fact, is an active approach where the health worker selects the type(s) of care that is (are) best for the patient. The health worker can either offer that care himself when possible, or he may refer to a colleague in his team who offers it, or he refers to a service availed outside his own facility.

Integrated care is an approach 'cutting through' all the different activities taking place at the first line (Figure 3). Integrated child care, for instance, refers to an approach whereby every single opportunity of contact between a health service and a child / patient / household / community is used in an optimal way so as to provide the under-fives with the care they need.





Some health care activities for under-fives may be structured within vertical programmes. This may have disruptive effects on the functioning of first line health services. Immunization programmes for instance, although they often claim to be entirely integrated, are usually piloted from a centralized administration and further channelled downwards. Vertical programmes are guided by a different logic compared to the one of primary health care services. They tend to focus on a limited range of quantifiable and thus measurable results. The priorities of the programme manager, the health worker and the family may be conflicting. A vertical programme manager tends to see his activities as having absolute priority and will strive to maximize impact. The manager of the versatile health care delivery system is confronted with the relative priority character of each single activity. He therefore tries to optimize care through the offer of a balanced packet of services. The offer of child-centred care also means that the child's, the mother's, and the household's perspective need to be considered. This may entail an even more relative order of priority. Families, and more in particular poor ones, consider health as a relative priority to be balanced with other priorities like housing, schooling, clothing, etc. The order of priority that people establish will obviously vary over time and from one person to the other.

The necessary articulation between vertical programmes and primary health care services often is a difficult process. In many instances an *operational* integration of the activities has been achieved but without *administrative* integration. The routinely offered health care in a first line health service combines interventions and activities related to different programmes. But quite often the tools for monitoring and reporting remain specific to each single programme. Resources for some activities, like outreach immunizations for instance, are often earmarked and conveyed through specific channels. The health workers' common sense, and his search for efficiency, will motivate him to take advantage of the

210

resources available for one particular activity to operate other activities not part of that programme. For instance some of the fuel available for Community-Based Growth Monitoring (CBGM) may be used for family planning outreaches, despite the fact that the programme of CBGM may forbid this. Hence, if a specific programme's resource dry up for a reason internal to one programme, then other activities at the level of the first line may be jeopardized.

The setting of targets to be achieved often takes place under pressure of the managers of the different programmes. Annual plans then look like a juxtaposition of different programmes whereas they should be the balanced result of a comprehensive and participatory analysis of needs and a balanced package of activities. The incentives (financial and others) attached to the achievement of the specific targets of a specific programme of course influence the focus of the staff of the first line. It may imbalance the basic package of activities and decrease the overall acceptability of the first line health service while trying to increase staff's responsiveness to some specific needs.

What is there to be done?

A variety of organizational changes can be proposed to change the way services are offered. The objective should be to arrive at a genuine integration of all activities relevant to decentralized versatile first line health services. It is beyond our scope here to review in detail what could be done; we will limit ourselves to a few examples. The patients' flow may be reviewed, a more appropriate system of appointments may be useful to reduce waiting time during peak hours, the distribution of tasks may be altered with different job descriptions, etc.

A good example of such an approach has been reported by Bossyns (9) in Niger with Family Planning services. In a set of First Line Health Services, the experiment introduced a package of new operational instructions to actively propose family planning, integrated within curative and under-fives consultations, and coupled with measures to increase the health centres' responsiveness to their clients. Patients procedures were made more flexible. Family planning services were integrated and special family clinics were abolished. Health staff was asked to systematically propose family planning to all eligible women presenting to the health centre and to engage in a respectful dialogue. Although earmarked family planning consultations disappeared, the number of new family planning acceptors and other outcome indicators remarkably increased as a result of these simple measures.

We discussed in the preceding section that the delivery of integrated care goes beyond the grouping of activities under one single roof. It is a matter of both rational organization of the service and of an appropriate attitude from the health worker. In reality this may lead to a variety of practical arrangements. When different tasks are distributed among different staff in one team, then regular communication between team members will always remain essential. If different but related activities are spread among different structures, then co-ordination and efficient information systems are required. Last but not least, there will always be the need for an open and empathic attitude from the health worker allowing him to seize all opportunities for needed care.

Methodological problems in the consultation process

The extreme standardization of clinical processes leaves little room for facilitation or negotiation

Still today most of the first line health services in sub-Saharan Africa, but also in other parts of the developing world, are not run by medical doctors but by less qualified health workers to whom clinical and managerial responsibilities are delegated. The leading criterion for doing so is the possibility to standardize the task at hand. Indeed, if well designed, the clinical-therapeutic decision making process can be standardized to an acceptable level to reduce uncertainty and to allow health personnel with low qualification to address many complex clinical situations and to cover most of the health care needs (18). Care for under-fives, be it in the curative consultation or during preventive activities, is practiced in most first line health services within the boundaries of standardized instructions, flow charts and protocols.

The core of the practice of patient-centred care is the facilitation and negotiation process. The encounter between health worker and patient is expected to lead to a common assessment of the patient's situation with regard to his health. If there is agreement about the existence of a problem, a plan of action is negotiated and agreed with the full participation of the patient (or his spokesman). It is clear that this model is conflicting with the expectation that staff should comply to a complete and precise set of instructions, guidelines and flow charts which link a given clinical observation to a given decision.

The initial experiences in African primary care services of standardization of procedures using flowcharts, beyond the

possibility to delegate complex clinical tasks, pursued two objectives. Firstly, the use of flowcharts was supposed to free the mind of the health worker from clinical reasoning which was hazardous as his competencies were limited, and to free consultation time so as to concentrate on the quality of the relationship with the patient. Indeed less qualified staff was expected to be in a better position to engage in an empathic relationship, being socially closer to his rural patient than would be a medical doctor. Secondly, the delegation of complex tasks to staff with limited qualification was considered as a means of human promotion. Delegation of tasks was seen as a motivation factor for staff (19). Regular supervision visits, training oriented, and carried out by senior practicing health professionals who were primarily responsible for the activities delegated and who had been closely involved in the design of the standardization of the procedures, was essential for the flexible use of flowcharts. The relationship between supervisor and the supervisee was characterized by the willingness of the former to take account of the difficulties met by the staff in applying rigid standards and by the openness and authority to adjust the procedures accordingly. In that perspective, it was expected that such a promotion of auxiliary personnel would gradually, and in the long run, upgrade them to a more professional status. Professional is here understood in the sense of a worker able to make independent decisions, based on his knowledge, and taken in the patients' interests. Such expectations only materialized when all the above-mentioned conditions and enabling factors were present. Scaled up at large level, the approach has shown to lead to a range of perverse effects: all too often it has reduced the clinical encounter to a mechanistic ritual (20).

The challenge: articulating patient-centred care with compliance to clinical and health programme standards

The tension between patient-centredness and standardization needs to be resolved. Moving the swinging of the pendulum from extreme standardization to an attitude of *laissez-faire* in a context where professionalism is still lacking in many instances would lead to the loss of all the benefits of policies of standardization and delegation of tasks. The challenge is to arrive at an optimal articulation of the facilitation-negotiation process with the need for conformity to given professional standards. We should not throw the baby away with the bathwater. In Europe professionalism has been the sole quality assurance mechanism for centuries. Today the guideline industry is flooding health professionals with potentially useful, but hardly manageable, evidence-based information at the point of health care delivery. In developing countries, guidelinebased clinical management has been a safeguard in a system where professionalism was weak.

Technical considerations and recommendations should be brought in during the facilitation process as part of the doctor's agenda, and then be considered as an element of the therapeutic planning negotiation. In Australia, a patient-centred model has been developed that suggests best practice occurs when there is a fusion of knowledge derived from the best available evidence, clinical experience and knowledge of the patient's lifestyle and preferences and then consideration of the remote rural context (21). This model is probably also relevant to less resourceful health services. The presentation by Isabelle François during this conference, and which is reported in this book³, of an experiment with an interactive model of care shows that it is indeed possible to give more flexibility of decision making to nurse-practitioners. In this interactive model of under-fives care, the health centre nurse was free to choose what type of investigation and what type of management was appropriate for each child situation. The nurse had access to a set of guidelines to apply, according to his/her own assessment. In addition, the nurse was requested to systematically ask the mother two open questions on how she perceived her child's health and her child's growth. The results clearly indicated that the interactive model of care increases staff satisfaction and accountability, and that it improves the outcome of child health care

Nevertheless, we should not be naive. A child-centred clinical method has definitely the potential to make health care more appropriate and more effective. It also has the potential to be recognized and valued by the staff practicing it. But it cannot be achieved overnight. The move from a biomedical to a biopsychosocial approach may also encounter strong resistance by the health personnel who may feel threatened and destabilized.

Social and cultural problems the health worker faces.

The existing role model of the health worker-patient interaction: more harm than good

The undergraduate training of medical personnel in most developing countries still focuses much on biomedical aspects. Hardly any post-graduate training programmes exist in the field of

³ François, I, Tonglet R *et al.* A randomised trial for the evaluation of a new model of routine child health care in Ouagadougou, Burkina Faso: the effects of changing practices and attitudes of he health staff.

family medicine. For most junior doctors, ill-prepared to take responsibilities at the peripheral levels of the health system, high technology hospitals are perceived as the privileged working place, and a hospital specialist career consequently is the profile most valued.

At the best, the patient-health worker interaction model follows a paternalistic approach. This is even more pronounced when dealing with rural populations. Yet the interaction model most practiced is probably the authoritarian model. In the health care profession, the socialization of personnel by peers is a very strong mode of role modelling. Therefore it is not surprising that a patientcentred approach is not common if an authoritarian model is prevailing. It is further passed on from health worker to health worker.

The way supervision is usually being conducted also conveys a message and fosters role models that do not contribute to childcentredness. To the question "How do you make a nurse care for his patients?", a South African family medicine professor answered "You care for him!". Ideally a supervision of health centre personnel should be supportive. It should address in an empathic way the various problems the team encounters in its daily work. It is striking how similar are the process of a patient-centred consultation and the process of a supportive supervision. Both are about facilitating the elicitation of clinical and managerial problems; both put the issues in a health policy perspective (evidence based medicine, programmes instructions and standards); both try to arrive at a common assessment of the problem and an agreement on the course of action to be taken. But in most instances supervision follows an authoritative style drawing on hierarchical relationships and conformity to procedures.

In many countries, the bulk of health services, especially preventive services and mother and child services are provided in the frame of public services. On the one hand, the identity of civil servants is more associated with the control of the population's general hygiene than with the supply of a service to the public. On the other hand, their identity as health worker is probably associated with a compassionate model of caring. There appears to be a conflict between the social identity as a civil servant exercising control by the state and the professional identity as a health care worker. It is not clear why the former seems so often to overrule the latter.

A variety of socio-cultural elements interfere in the consultation process: a complex and contextual web

There may be good reasons for a health worker not to engage in a child-centred relationship. In a traditional hierarchical society a health worker may feel he does not have the legitimacy to discuss family related problems. A growth problem with an illegitimate child in an HIV high prevalence area would require a good understanding of the family context. Yet it would not be surprising to see a young unmarried nurse very reluctant in such a context to engage in an empathic relationship and to enquire into the family complex.

The boundaries of the therapeutic alliance are not necessarily easy to delineate. Especially when empathy in health care is not part of the usual behaviour of health workers. A nurse-practitioner may fear to get entangled in endless social obligations if he starts to be involved in the social dimensions of health problems. In Conakry, a local NGO (Fraternité Médicale Guinée) developed health centres with a strong social mission statement. At one stage, children consulted for long-standing physical disability. The health centre contacted an existing orthopaedic centre and children were provided with appropriate prostheses. Parents, children and staff did not stop at this stage though the clinical rehabilitation was achieved. The new emerging felt need for these children was one of social rehabilitation. An education project supported by the medical NGO was then created. This was possible because of strong social identity of the facility and because it had developed a network of partners supporting their initiatives. But this is an exceptional situation. In most instances, in the absence of support from a network of social services, it is not surprising to see health workers reluctant to open the "black box" of social problems. It is then (understandably) easier to stick to pure biomedical answers.

One of the comparative advantages of having nurses instead of medical doctors staffing first line health services was seen in the social proximity of nurses with their patients. But this does not automatically imply a more open attitude in the work situation. A career in the public service may be a means for the nursepractitioner precisely to mark a social difference with the community he emerges from. In addition, there often exists a problem of ethnic differentiation because in some countries it is customary to post civil servants far from their community of origin in order to prevent attitudes of patronage. Moreover, as we mentioned above, we cannot take for granted that the dominant professional identity of the nurse is one of caring.

Health services in many countries are plagued with corruption. Health workers, like other civil servants, have developed

a variety of coping strategies to improve their living, taking advantage of their position. First attempts to describe and analyze this behaviour have taken place (20). They show that different forms of petty corruption are generalized. To some extent, the involvement in such coping strategies is part of the socialization process for the health workers and is justified by the low salaries they are paid. Some of these coping strategies remain rather neutral in terms of patient-health worker interaction: this is the case, for example, of the (ab)use health workers may make of the many opportunities for training workshops (17). But others strategies are clear forms of racketeering and are obviously conflicting with a patient-centred attitude. It will be useless to attempt any change in patient-health worker interaction, unless such behaviour is being addressed.

Create a social climate that is favourable to child-centred care: fostering professional identity, raising accountability, deterring coping strategies and supporting staff

Unless the many social and anthropological barriers to childcentred care are being addressed, one may expect resistance to change from staff. A comprehensive package of interventions of different kinds must be considered. First, a professional identity focusing on caring should be promoted. Second, alternatives to coping strategies that conflict with an harmonious patient-health worker interaction should be looked for. These alternatives should permit the staff to have a decent income and to restore morale. Third, strategies to increase accountability of health personnel towards the public must be proposed. Fourth, innovative approaches should be developed to create or to strengthen networks of social services to which the health worker can refer for further support. Fifth, support must be provided to the health workers to help them reflect on the difficulties they will undoubtedly encounter when they start engaging in more empathic and committed relationships. This could take the form of discussion groups of professionals. 'Balint groups' represent an interesting example of such discussion groups usually set up to provide psychological support to medical doctors. Experiments of discussion groups involving patients and health workers have shown effectiveness for structuring the social support to psychiatric patients in Guinea (22). These discussion groups gathering health workers could be structured as a forum where health workers can share their fears, their practical difficulties or successes, while at the same time building a culture of commitment and proactive behaviour in addressing their patients' demands.

Where lie the priorities? A research agenda

We propose to answer this question by raising three other ones. Firstly, where is the problem? Secondly, what are the determinants of the problem? And thirdly, what can be done to tackle the problem? What works and what doesn't work?

Where is the problem? A general consensus on the lack of childcentredness probably exists

Descriptive surveys in many developing countries repeatedly pointed to the fact that today there is a major problem in terms of acceptability of health care delivery in modern health services, especially when the relational aspects are concerned. The past twenty years there has been a strong focus on the managerial aspects in the development of local health systems. This probably contributed to underestimate the importance of the interpersonal relationships in the provision of health care in general. Yet interpersonal relationships are known to be major determinants of quality in health care. In 1979 already Donabedian made the distinction between technical care and interpersonal relationship in the management of an episode of illness (23). This is even more relevant in situations where the relationship is not a binomial colloquium but where it consists of a triad 'mother-child-health worker'. Little space, so far, has been given to participation and empowerment in health care programmes that target under-fives and older children. Empirical observations converge to the need to put child and mother's perception, feelings and opinions at the very centre of the entire child-care process. This is consistent with the perceived lack of client-centredness and accountability towards the public in many public services in Africa. Further research to demonstrate this need is no longer a priority. It is now time to move forward.

What are the determinants of the lack of PCC? Need to investigate the complexity of this multidimensional problem

What is, however, still largely lacking is a thorough understanding of the precise determinants of this lack of patientcentredness. The mere training of staff in communication skills will not solve poor communication. As we pointed out earlier, childcentredness goes far beyond a mere technical issue. There is a need for an inventory, specific to each setting, of the various structural and organizational obstacles to the provision of child-centred care. The reasons for the rude staff behaviour vis-à-vis patients must be understood, unveiled, sociologically decoded and openly discussed in a non-judgmental way. Staff's underlying coping strategies should be identified, addressed and possible alternatives explored. Eventually, more research is needed to develop a more appropriate (i.e. child-centred) clinical method, suitable in situations where there is no qualified medical professional, and which appropriately balances the need for conformity to professional standards with the need for responsiveness to the individual situation of each single child. This new development of the clinical method in African childcare must contribute to the promotion of more professionalism among the health workers.

What strategies work and what strategies do not work? Need to test multidisciplinary interventions aiming to promote child-centred care

We urgently need field trials and demonstration projects to test what works and what does not work. Innovative research programmes must be conducted to identify the most appropriate strategies to boost a more child-centred approach to child health. This research should build on multidisciplinary approaches. Acting solely on communication patterns or on managerial issues or on clinical techniques will not be sufficient. We should encourage a research framework that combines managerial, clinical and socioanthropological approaches and that gathers field practitioners, public health experts, family medicine specialists and socioanthropologists.

Positivist research approaches are unlikely to be appropriate for the investigation of the problem and for the identification and testing of possible solutions. Quality improvement techniques often follow a linear reasoning in search of a single root cause to tackle. This would mean considering the clinical interaction as a simple linear process. But the problem is clearly multicausal and relates to several domains and disciplines (biomedical, sociological, anthropological and managerial). The reasons for the lack of patient-centredness are as complex as the possible strategies to address it. We need to move away from naïve positivism and adopt a research and intervention methodology able to deal with complexity. Action research is one of the methodologies that have the potential to deal with complex systemic problems. But innovative approaches are most welcome in an area that is likely to become a major topic for health systems research in the years to come. Perhaps the principal challenge, since Alma Ata, in the promotion of appropriate child health care is to increase the responsiveness of child-care programmes and services through the implementation of more child-centred health care delivery systems.

References

- 1. Van Balen H, Van Dormael M. Health service professionals and users. *Unesco*, 1999;313-26.
- 2. Levy-Bruhl D, Soucat A, Osseni R, Ndiaye JM, Dieng B, de Bethune X *et al.* The Bamako Initiative in Benin and Guinea: improving the effectiveness of primary health care. *Int J Health Plann Manag.* 1997;**12 Suppl 1**:S49-S79.
- 3. Maiga Z, Traoré FN, El Abassi A. La réforme du secteur santé au Mali, 1989-1996. *Antwerp: ITG Press*, 1998.
- 4. Garner P, Panpanich R, Logan S. Is routine growth monitoring effective? A systematic review of trials. *Arch Dis Child.* 2000;**82**:197-201.
- Jaffré Y, Olivier de Sardan J. Principaux résultats. In Jaffré Y, Olivier de Sardan J (Eds.). Les dysfonctionnement des systèmes de soins. Rapport du volet socioanthropologique. Enquêtes sur l'accès au soins dans 5 capitales d'Afrique de l'Ouest, pp 11-60. Projet "Santé Urbaine" (UNICEF-Coopération française), 2002.
- 6. Haddad S, Potvin L, Roberge D, Pineault R, Remondin M. Patient perception of quality following a visit to a doctor in a primary care unit. *Fam Pract.* 2000;**17**:21-9.
- 7. Haddad S, Fournier P, Machouf N, Yatara F. What does quality mean to lay people? Community perceptions of primary health care services in Guinea. *Soc Sci Med.* 1998;**47**:381-94.
- 8. Bchir A, De Brouwere V. The performance of medical doctors in Tunisia. *Studies in Health Services Organisation & Policy*. 2000;**16**:33-44.
- 9. Bossyns P, Miye H, Van Lerberghe W. Supply-level measures to increase uptake of family planning services in Niger: the effectiveness of improving responsiveness. *Trop Med Int Health.* 2002;**7**:383-90.
- 10. Mead N, Bower P. Patient-centredness: a conceptual framework and review of the empirical literature. *Soc Sci Med.* 2000;**51**:1087-110.
- 11. Brown J, Stewart M, McCracken E, McWhinney IR, Levenstein J. The patientcentred clinical method. 2. Definition and application. *Fam Pract.* 1986;**3**:75-9.
- 12. Levenstein JH, McCracken EC, McWhinney IR, Stewart MA, Brown JB. The patient-centred clinical method. 1. A model for the doctor-patient interaction in family medicine. *Fam Pract.* 1986;**3**:24-30.
- 13. Fehrsen G, Henbest R. In search of excellence. Expanding the patient-centred clinical method: a three-stage assessment. *Fam Pract* 1993;**10**:49-54.
- 14. Henbest RJ, Fehrsen GS. Preliminary study at the Medical University of Southern Africa on student self-assessment as a means of evaluation. *J Med Educ.* 1985;**60**:66-8.
- 15. Howie JG, Heaney DJ, Maxwell M, Walker JJ. A comparison of a Patient Enablement Instrument (PEI) against two established satisfaction scales as an outcome measure of primary care consultations. *Fam Pract.* 1998;**15**:165-71.
- 16. Meessen B. Corruption dans les services de santé: le cas de Cazenga. Repères Médecins Sans Frontières Belgique, 1997.
- 17. Van Lerberghe W, Luck M, De Brouwere V, Kegels G, Ferrinho P. Performance, working conditions and coping strategies: an introduction. *Studies in Health Services Organisation & Policy*. 2000;**16**:1-5.
- 18. Equipe du Projet Kasongo. Stratégies de diagnostic-traitement à la consultation curative primaire. In Meheus A, Butera S, Eylenbosch W, Gatera G, Kivits M, Musafili I (Eds.). Santé et maladies au Rwanda, pp 217-37. Bruxelles: Administration Générale de la Coopération au Développement (AGCD), 1982.
- Equipe du Projet Kasongo. Utilisation du personnel auxiliaire dans les services de santé ruraux: une expérience au Zaïre. Bull Organ Mond Santé. 1976;54:625-32.

- 20. Blaise P, Kegels G. Mintzberg, organisation's configuration and quality management in health care. *Quality in "professional organisations"* Higher Education and Health Care. Proceedings. Fourth "Toulon-Verona" Conference Polytechnic Faculty of Mons Belgium 30 and 31 Aug.2001, pp 25-41. *Mons*, 2001.
- 21. Taylor J, Wilkinson D, Blue I. Towards Evidence-Based General Practice in Rural and Remote Australia: An Overview of Key Issues and a Model for Practice. *Rural and Remote Health1, http://rrh.deakin.edu.au* 2001.
- 22. Fraternité Medicale Guinée. Second comité scientifique du projet SaMOA. Conakry, Guinea 12-14 Fevrier 2002. Conakry, Projet SaMOA Guinée, MMB. 2002.
- 23. Donabedian A. The quality of medical care: a concept in search of a definition. *J Fam Pract.* 1979;**9**:277-84.

PROMOTING CHILD WELL-BEING: THE CASE FOR INTEGRATED GROWTH AND DEVELOPMENT INTERVENTIONS

Gretel Pelto¹, Katherine Dickin¹, Patrice Engle²

Introduction

There is a general consensus in public health and medicine that growth of children is a good measure of their physical wellbeing. When growth trajectories follow normative standards this indicates that children are experiencing adequate nutrition and health. In addition to a large body of data linking good nutrition to good growth, there is also substantial evidence that in early childhood better physical growth is associated with better psychological development, as assessed through tests of psychomotor, cognitive and social-emotional status. However, good physical growth does not guarantee good psychological development, and there is a considerable amount of research demonstrating the significance of supportive, responsive and stimulating environments in enabling children to achieve their psychological potential. Thus, an extensive body of empirical data, together with well-structured theoretical models, led to the proposition that integrated growth and development interventions are likely to be particularly effective in promoting child well-being

In this paper we will address three questions that follow from this proposition:

- What do we know about the effectiveness of interventions to improve growth in conditions of endemic undernutrition?
- Is it a good idea to incorporate activities to improve psychological development in growth promotion interventions?
- What are the implications of integrating growth and development activities for programmes and for research?

In addressing these questions, we draw heavily on a review that was conducted by the Department of Child and Adolescent Health and Development of WHO, and which is available as a monograph titled: *The Critical Link: Interventions for physical growth and psychological development (1).* The review represents the work of a multidisciplinary team that included nutritionists,

¹ Division of Nutritional Sciences, Cornell University, Ithaca, NY

² Child Development and Nutrition, UNICEF, New Delhi, India

epidemiologists, psychologists, anthropologists, as well as policy science experts.

To prepare the review evidence was collected from many sources, ranging from published articles in peer-reviewed journals to programme reports, papers and educational materials. The data on impact of interventions come from two main types of studies: efficacy trials and programme effectiveness evaluations.

Efficacy trials typically utilize an experimental design in which the intervention group receives the treatment while a comparable control group does not. Some of the efficacy trials are, in effect, clinical trials in the community, while others are designed in such a manner that they are, actually, a test of real world efficacy with a best case scenario -- because they use a delivery system that either potentially feasible or is already in place. In a well-designed efficacy trial investigators work hard to ensure that the intervention is delivered under the best possible circumstances. Efficacy trials are reported primarily in refereed journal articles and in review papers. The second main source of data was programme evaluations, Some

of these evaluations also appear in journal articles and reviews. Some were available only in the so-called grey literature of programme documents. These also cover a range from small-scale pilot projects that closely resemble efficacy trials to evaluations of large-scale multi-site programmes.

What do we know about the effectiveness of interventions to improve growth in conditions of endemic undernutrition? Over the decades there have been a number of different types of research and programme activities to promote physical growth in conditions of endemic undernutrition. These different types were classified as follows:

- Supplementary feeding of pregnant and lactating women
- Supplementary feeding of children under five years of age
- Rehabilitation and feeding of undernourished children
- Correction of nutrient deficiencies (multiple and individual)
- Nutrition education to improve breastfeeding, complementary feeding
- Production of special complementary foods
- Growth monitoring and promotion

Within these broad categories, one can also create subdivisions based on the mechanism by which the intervention is delivered. For example, types of interventions to address micronutrient deficiencies include: food fortification, nutrient supplements and capsule distribution, food-based programmes, and special focus nutrition education activities. Another set of examined interventions are activities that address more distal determinants of poor growth. These include: water and sanitation interventions, control of disease through medical services and immunizations, interventions to increase household food security (eg through food subsidies, food for work programmes, agricultural production and credit programmes) and interventions to increase maternal education, delay childbearing and increase birthspacing.

What can be concluded about effective interventions from this large body of information?

With respect to the direct, nutrition-related interventions, one can say:

- Most interventions work some of the time.
- No interventions work all of the time.

Other broad generalizations that can be supported with empirical data include:

- Interventions during the earliest period of life pre-natally, during infancy and early childhood are likely to have the greatest impact.
- Greater effects are usually seen with interventions of longer duration and higher intensity. However, positive effects of short-term interventions, particularly with micronutrient supplementation, have also been demonstrated
- The children in greatest need are generally the ones who show the greatest response to growth interventions.
- Programmes that use several types of interventions and more than one delivery channel are more efficacious than those that are more restricted in scope.
- Programmes that address distal determinants of nutrition (eg. Immunization, water and sanitation) can be effective in reducing malnutrition when they are accompanied by nutrition and health education activities.

Beyond this very general level, it is not possible to specify which <u>types</u> of interventions are more effective. In part this cannot be done because comparisons among the many different kinds of intervention activities are not easy to make. Certainly, efficacy and effectiveness studies are not comparable and available data do not permit systematic examination of different interventions internal to these two broad categories. Moreover, differences in the methodological quality of studies across the range of efficacy and effectiveness designs also constrain the possibility of making useful comparisons. Apart from technical problems, the most important reason that it is difficult to make blanket statements about the relative effectiveness of different types of interventions is that they are always **context specific**. They are context specific with respect to the biological context, the environmental context and the socio-cultural context.

With the biological context the locus of the intervention is the individual. There is an increasing body of scientific knowledge documenting the significance of such biological context characteristics as how an individual's degree of nutritional deficit or how characteristics of diet affect biological responses to nutrition interventions. The influence of the environmental context, which affects both individuals and populations, includes such factors as endemic parasites and poor sanitary conditions.

The socio-cultural context of interventions has multiple influences on their potential effectiveness - on individuals, families, and communities. Beginning with the most macro-level of social policy and political conditions, examples of the types of context factors that affect the impact of interventions include the presence or absence of specific national policy instruments and international and donor funding priorities. Context factors at the political level include public support for particular kinds of interventions and the social orientation of political leadership.

The administrative and programmatic context is a significant factor in intervention outcomes. Among the characteristics that may be influential are:

- The organizational structure of government agencies;
- Level of development and co-ordination of NGO activities;
- Educational, skill levels and motivation of staff;
- Performance incentive structures;
- Efficiency of procurement procedures; and
- The complexity of participation procedures.

The characteristics of social systems and social structure at community level, as well as differential economic resources at the level of communities also have major influences on the effectiveness of interventions. For example, features of community infrastructure, such as transportation and education facilities, as well as social barriers produced by caste and class differentials may all influence interventions. At the micro-level of socio-cultural context are the profound influences of such familiar factors as intra-household food distribution, cultural beliefs and child care practices.

The influence of context factors on the effectiveness of growth promotion interventions is so great that developing strategies for understanding these factors and for working with them in the planning and implementation of programmes is fundamental to their success.

Is it a good idea to incorporate activities to improve psychological development in growth promotion interventions?

The arguments for joint or integrated growth and development interventions fall into two categories: theoretical/scientific and practical.

At the scientific level, there is a large body of empirical data and sound theoretical models that show a very close linkage between physical growth and psychological development, particularly in early childhood. The process that produces growth faltering also produces delayed development (2). Some of the delay in psychological development, particularly in motor skills, appears to be mediated by delayed physical development. Simply improving nutrition improves development, even without any other intervention (3,4). However, one should not conclude that the positive effects on development of improving nutrition are due solely or even mainly to biological mechanisms. Malnutrition in children, as in other animals, has behavioural effects, such as reduced activity and increased emotional reactivity, which compromise the individual's ability to interact with his or her environment in ways that affect development (5).

Three efficacy trials that used both nutrition and psychological development interventions in conditions of endemic undernutrition provide important empirical data to evaluate the impact of combined interventions (6-11). All three studies found that a psychosocial intervention led to significant improvements in psychological development, and the nutrition intervention had positive effects on growth. Two of the three studies found that the combined interventions had a greater effect on psychological development than either intervention alone, and one study showed that the combination of nutrition and psychosocial activities had a greater effect on physical growth than either one alone.

There is other research that points to the relationship between nutritional status of children and care-giver behaviour. A healthy, well-nourished child is better able to elicit care-giving and to profit from environmental stimulation. On the obverse side, there is a tendency for dysfunctional feeding and dysfunctional interaction patterns to occur in the same families (12) Thus, increasing caregivers' skills may enable them to provide not only improved nutritional care, but also improved psychosocial care. Helping caregivers to undertake child feeding and other care practices in a responsive, stimulating fashion is likely to result in social and cognitive as well as nutritional improvements (13,14). In short, theoretically-based arguments for improving parental care-giving as a strategy for improving child well-being point to the potential value of integrated growth and development interventions.

At the practical level, there are a number of potential advantages to the incorporation of child development activities into nutrition interventions. To date the majority of child development interventions have been organized under the rubric of early child development and care (ECCD) and have been directed to the older pre-school child – usually from ages three to five. In contrast to the multiplicity of early intervention programmes for nutrition in countries with high rates of undernutrition, programmatic activities for very early interventions for development are much less common and the structural arrangements to support them are not as well established. Including development concerns in nutrition activities is one mechanism for moving toward truly integrated programmes.

The negative effects of poverty on child well-being means that the children who are at high risk for undernutrition are also those who are most likely to benefit from development interventions. Given the difficulties of outreach to those most in need, it makes sense to provide integrated services once the efforts have been made to establish contact and motivate participation.

For parents combining nutrition and development activities may be particularly motivating. One of the serious challenges that nutrition interventions have faced is that preventing mild to moderate undernutrition is not usually a priority for families because the level of malnutrition that results in growth stunting, without overt clinical signs, is rarely perceived to be a problem. On the other hand, parents are generally very interested in promoting cognitive development of their children, particularly as societies become more technologically developed and school success gains importance. Linking nutrition and development activities may, therefore, be more appealing for parents and, as Caulfield et al (15) have noted, one element that is associated with the programme success is the linking of activities to parental aspirations.

At the programmatic level, integration of nutrition and development activities (whether through incorporation of the latter into nutrition programmes or through new, integrated formats) is likely to result in cost savings, through efficiencies in materials, training and personnel. Materials that deal simultaneously with child feeding, care and educational practices have been created by some programmes around the world, and personnel have been trained to use them. However, most of these efforts are small-scale and have not been adequately evaluated. Thus, while it is reasonable to expect cost savings, presently available data do not permit a quantitative, empirical demonstration of this proposition.

Apart from administrative efficiencies, there may be other benefits to integrated programmes in terms of job satisfaction for frontline workers. Motivated by a desire to help families in need, front-line workers may find it intrinsically rewarding to be able to offer an integrated set of services to clients facing multi-dimensional challenges, rather than being restricted to a narrow programme focus. For example, Community Nutrition Educators (CNEs) in a nutrition programme for low income families in the U.S. expressed strong belief in the value of their programme because they were able to go beyond teaching nutrition to help programme participants with issues such as parenting and child-feeding practices, family relationships, and the development of self-worth and selfconfidence. CNEs were motivated by an interest in caring for "the whole person" and felt that this was facilitated by the breadth and flexibility of programme content (16) Among these workers, valuing the programme was strongly associated with high levels of job In addition, the job of a front-line worker satisfaction (17). providing integrated services is likely to include greater variety, a factor known to be related to worker motivation (18), as well as opportunities to develop new knowledge and skills.

What are the implications of integrated activities for programme development and for research?

In the previous section some of the advantages of combined nutrition and child development activities were mentioned from the perspective of programmes and families. However, there will also be significant social and organizational challenges.

At the level of the family there are constraints on the amount of time and resources that are available to care-givers, especially mothers, and other family members. Programmes must take care not to over-burden them with additional tasks that make child care more time-demanding, and it may be necessary to create additional support structures to prevent this.

It is essential that programmes do not fall into the trap of making parents feel guilty or at fault for deprivations that arise from conditions in the environment. Both Richter (19) and Myers (20) have pointed out the potential for disempowering parents through the creation of alternative care structures. Combined interventions need to take steps to avoid a similar danger with home-oriented activities. Without thoughtful attention to this potential it would be possible for programmes to create feelings of inadequacy on the part of parents and other care-givers.

An important challenge for the development of integrated programmes is how to deal with issues of coordination across departments and agencies. Existing structures may need to be altered and activities within these structures will inevitably be affected. Sensitivity to the problems that are created by such structural and organizational changes is the first step and careful planning to resolve problems as they arise will be essential for effective programme development.

Another challenge that programmes need to be aware of as they move toward integration is the likelihood that different components of programmatic activities may be differentially successful. As described above, the ways in which contextual features can affect interventions is very complex. As a result, some elements may be more readily accepted or easier to implement than others. Programmes need to guard against the possibility of internal dissension if this occurs. They also need to be prepared to deal creatively with external criticism and the potential for loss of support for a larger programme when some elements are not as popular or do not get implemented as easily as other elements.

At the programmatic level, integration inevitably presents special challenges with respect to a number of administrative concerns, including the need to avoid overloading the supervisory and management system, as well as facilities. Most important are the effects on frontline workers. A fear of putting undue stress on community-level workers and exceeding their technical capacity has been one of the main elements of the rationale for vertical programmes. It would clearly be counter-productive to sacrifice the quality of activities at the community level in order to achieve integration. To avoid these negative consequences will require new tools, curriculum guides, and training procedures and careful monitoring and supervision. To that end, we propose a series of procedures that are intended to facilitate the process of creating and implementing an integrated growth and development programme.

Steps toward an integrated growth and development programme for communities with endemic undernutrition

• Develop a generic counselling package, which can serve as the basic template for programmes. Together with the generic materials there must be clear guidelines for what needs to be done to adapt it to local cultural and environmental

conditions, including suggestions on strategies and procedures for this process.

- Identify potential mechanisms and channels for delivering the package. (These may include existing growth promotion programmes, existing child development programmes, breastfeeding programmes, community health worker outreach activities, community organizations, health service contacts.)
- Develop guidelines for working with community organizations and involving families in the development of the programmes, including local adaptation.
- Develop guidelines for identifying families who need additional supports in order to implement recommendations and procedures for facilitating these supports.
- Develop tools to facilitate the delivery of the integrated counseling package, including guides for training and retraining monitoring and supervision.
- Develop evaluation tools. As with general guidelines, these need to be locally adapted, including the methods that are used to assess child development.

The effective operationalization of the procedures we have outlined above dependent on large sectors of knowledge, most of which are only partially available at present. In the absence of a fuller understanding, the options are to wait until the knowledge base is better developed or to proceed, while at the same time working to build such knowledge. Keeping in mind the underlying principle to "do no harm," and with the appropriate cautions that this principle enjoins, it appears likely that the latter course is preferable. However, it is important to work simultaneously to improve the knowledge base. This can be done, on one hand, through studies associated with programme implementation, and, on the other, with efficacy trials and other basic research to address critical gaps in knowledge. Among the questions that need attention are the following:

- What are effective approaches for giving families information on child needs and how to meet them? How do these vary in relation to cultural context?
- What are effective techniques for building care-giver skills? Does the use of modeling and culturally appropriate communication facilitate skill acquisition?
- What are the major constraints to "responsive care-giving" and what mechanisms are most effective in overcoming these constraints?" (eg. What is role of care-giver time allocation and availability, self esteem, control over resources, etc.)

Addressing these and other questions concerning the determinants and mechanisms that favor or constrain responsive care-giving in the contexts of poverty and undernutrition will require the investment of economic, institutional and intellectual resources. One of author's conclusions from carrying out the review process is that there is a need for much greater research attention to fundamental questions about how to support child well-being and meet child needs in the difficult conditions that many of the world's families face. In addition to the investments that are made to alleviate or modify these conditions and their effects, greater investments in research that would permit more effective use of these investments is essential.

Acknowledgments

J-P Habicht, D Pelletier, J Martines, J Lucas, M Black, L Richter

References

- 1. Pelto GH, Dickin K, Engle P.A Critical Link: Interventions for Physical Growth and Psychological Development. A Review. Dept. of Child and Adolescent Health and Development. *Geneva: World Health Organization*, 1999.
- 2. Beaton GH. Small but healthy? Are we asking the right question?. Eur J Clin Nutr. 1989; **43**(12):863-75.
- 3. Gorman KS. Malnutrition and cognitive development: evidence from experimental /quasi-experimental studies among the mild-to-moderately malnourished. *J Nutr.* 1995;**125**(8S):2239S-2244S.
- Martorell R. Undernutrition during pregnancy and early childhood: consequences for cognitive and behavioural development. In: Young ME (Ed.): "Early child development: investing in our children's future". *Amsterdam: Elsevier*, 1997;39-83.
- 5. Levitsky DA, Strupp BJ. Malnutrition and the brain: changing concepts, changing concerns. *J Nutr.* 1995;**125**(8S):2212S-2220S.
- 6. McKay H, Sinisterra L, McKay A, Gomez H, Lioreda P. Improving cognitive ability in chronically deprived children. *Science*. 1978;**200**:270-278.
- 7. Pollitt E, Perez-Escamilla R. Growth improvements in children above 3 years of age: the Cali study. J Nutr. 1995;**125**(4):885-93.
- Waber DP, Vuori-Christiansen L, Ortiz N, Clement JR, Christiansen NE, Mora JO, Reed RB, Herrera MG. Nutritional supplementation, maternal education, and cognitive development of infants at risk of malnutrition. *Am J Clin Nutr.* 1981;**34**:807-813.
- 9. Super CM, Herrera MA, Mora JO. Long term effects of food supplementation and psychosocial intervention on the physical growth of Colombian infants at risk of malnutrition. *Child Develop.* 1990;**61**:29-49.

- Grantham-McGregor SM, Powell CA, Walker SP, Himes JH. Nutritional supplementation, psychosocial stimulation, and mental development of stunted children: the Jamaican Study. *Lancet.* 1991;338:1-5.
- 11. Walker SP, Powell CA, Grantham-McGregor SM. Early childhood supplementation and cognitive development, during and after intervention. In: "Nutrition, health, and child development". Scientific Publication 566. Pan American Health Organization, Tropical Metabolism Research Unit of the University of the West Indies, and The World Bank, 1998;69-81.
- 12. Black MM, Hutcheson JJ, Dubowitz H, Berenson-Howard J. Parenting style and developmental status among children with non-organic failure to thrive. *J Pediatr Psychol.* 1994;**19**:689-707.
- Puckering C, Pckles A, Skuse D, Heptinstall E, Dowdney L, Zur-Szpiro S. Mother-child interaction and the cognitive and behavioural development of four-year-old children with poor growth. *J Child Psychol Psychiatr.* 1995; 36:573-595.
- Polan HJ, Leon A, Kaplan MD, Kessler DB, Stern DN, Ward MJ. Disturbance of affect expression in failure to thrive. J Academy Child Adolesc Psychiatry. 1991;30:897-903.
- 15. Caulfield LE, Huffman S, Piwoz E. Interventions to improve complementary food intakes of 6-12 month old infants in developing countries: impact on growth, prevalence of malnutrition, and potential contribution to child survival.
- 16. Dickin, KL. (unpublished) The impact of the organizational and work environment on Cooperative Extension nutrition education programmes. Doctoral research, in progress.
- 17. Dickin, KL, Dollahite JS. The influence of supervisors' leadership behaviour on the work attitudes of front-line nutrition educators: A study of EFNEP in New York State. Paper presented at Nutrition Education for Diverse Audiences II: Integrating Research and Practice, a conference held in Dallas, TX, September 10-13, 2001.
- 18. Hackman JR, Oldham GR. Work redesign. *Reading, MA: Addison-Wesley*, 1980.
- Richter L. Many kinds of deprivation: young children and their families in South Africa. In: Eldering L, Leseman P (Eds.): "Early intervention and culture: preparation for literacy: the interface between theory and practice". *Paris: UNESCO*, 1994.
- 20. Myers R. The twelve who survive: strengthening programmes of early childhood development in the third world. *London: Routledge*, 1992.

TRENDS IN NUTRITION POLICY AND PROGRAMMES AND HOW THEY FOCUS ON GROWTH AND DEVELOPMENT

Michael Latham¹

Introduction

Although the serious problems of malnutrition in developing countries have not changed very much over the last 40 years, we have seen each decade, or so, a new panacea, or paradigm, or magic bullet, which is claimed, will greatly reduce prevalence by a targeted date. Between 1955 and 1965 protein deficiencies were seen as the major problems and products such as fish protein concentrate, single cell protein and cereals fortified with amino acids were offered as magic bullets. In the 10 years from 1965 after the "protein fiasco", Nutrition Rehabilitation Centres and Applied Nutrition Programmes were offered as sure solutions. For a decade from about 1975 malnutrition was viewed as needing macro changes, and first nutrition planning and then nutritional surveillance became the dominant strategies while economists and planners began to replace paediatricians and nutritionists as the principal architects of new policies, with much talk of poor nations achieving national food security. In the period beginning in the mid 1980's we saw the IMF, influenced by Reaganomics, push structural adjustment and market economics, while WHO and UNICEF reinvented Applied Nutrition Programmes (ANP's) which they renamed Joint Nutrition Support Programmes (JNSP's). Most recently the major concentration has been on micronutrient deficiencies, also termed "hidden hunger," some of which allow agencies to concentrate on "quick fixes" while ignoring the underlying causes of malnutrition (1).

Although many of the interventions were aimed mainly to address serious problems of malnutrition, most were recognized as aiming also to improve growth and development of children even if this was not the main stated objective. Through almost all these years, in one form or another, growth monitoring (GM) of children has been practiced, and often has concentrated on weighing and charting, rather than growth promotion. GM has a long history (2) of enthusiastic advocacy and even bloated rhetoric, despite the fact

¹ Professor of International Nutrition, Cornell University, Ithaca, NY 14853, U.S.A.

that there is little scientific evidence to prove its effectiveness as Aspects of growth promotion using commonly practiced. information from the mother, the community and local health workers have been relatively ignored. There is often a false assumption that the mother is lacking more in knowledge and in desire to care, rather than in resources and time; and that she has access to reasonable health care, when all too often the health care system is dysfunctional. Throughout much of the period, and especially in recent times, very little is being done to reduce poverty, and especially inequity, yet these are the very root causes of Nutritionists have seemed unwilling to advocate malnutrition. revolutionary policies needed to reduce malnutrition which include improving equity, changing the economic order, and taming globalization, while promoting universalisation of human rights including rights to adequate food, health and care (3). Through all these years external funds targeted for development, including for nutrition and health, have not been well spent. A very large proportion benefits the donors, plus the well remunerated persons who they support, and a rather small proportion has reached the intended beneficiaries.

Recently, with the pandemic of HIV/AIDS which has devastated many African countries, and is now marching relentlessly into South Asia, most nutritionists seem to have largely abrogated HIV's contribution to malnutrition to virologists and AIDS specialists. We see a huge mushrooming of NGO's concentrating on HIV/AIDS and in some cases a weakening of NGO's whose mission has traditionally been to address malnutrition, child health and infant feeding in developing countries (4).

Reasons for inadequate success in improving growth and development

Looking historically at actions promulgated over the past 40 years to control malnutrition in the developing countries of the south leads to the conclusion that we have been much less successful than was hoped, and it is important to search for reasons for this relative failure. The variable, but in general disappointing, reduction in childhood malnutrition manifested in the form of stunting and underweight can be laid at the door of many players. These include the governments of developing countries; the world economic order (or disorder) wedded to the marketplace and recently to super-capitalism with power shifting from governments to giant transnational corporations (TNC's); many non-government organizations (NGO's) which often base their programmes on prevailing nutrition fashions and which, of necessity I suppose, follow the money which may be tied to interventions which may not be optimal; professionals, both academic and field based, who often have influenced, and then supported, changes in direction in the dominant actions to control malnutrition even if these are not evidence-based; and UN and other international agencies who despite ACC/SCN have often been disunited, and too often embrace quick fixes while not addressing the basic causes of malnutrition related to inequity, poverty and national debt. Almost all these players have concentrated much more on reducing infant and young child mortality, than improving the health and quality of life of the survivors. The clear evidence that mild or moderate malnutrition manifested as stunting and underweight contributes so importantly to child deaths (5) should serve as an added rationale for concentrating resources and actions on prevention of malnutrition, by maintaining good growth and development.

My thesis is not that the dominant interventions of past decades had no validity, but rather that they were not panaceas to end malnutrition and often they were not evidence based. They were often more curative than preventive. There has been too little recognition that malnutrition, as well as IMR, are adversely influenced by inequity, and that over the last three decades many poor people have become poorer, and rich people richer; and that inequity has increased almost everywhere both north and south.

But returning to the dominant nutrition interventions of previous decades, I believe that all had some valid basis, and all still have some place in our armamentarium of actions to reduce malnutrition. But none were, and none are, panaceas. Very often the stated targets were unrealizable; the promises of what would be achieved were empty; the manner of their implementation was flawed; and most importantly the claims were not evidence based. The answer then is to take from each of these intervention strategies those aspects that work and have been proved effective, to add new actions based on new evidence, and then to co-ordinate a rather broad set of interventions into a more coherent whole, while addressing the very serious underlying causes of malnutrition including inequity and poverty.

It is clear that protein deficiency is not the main cause of malnutrition in the world (6), but protein remains an essential macronutrient. The pendulum may have swung too far, where protein rich foods such as legumes and small amounts of animal based foods are not now adequate in the diets of many children in disadvantaged families in developing countries. The importance of small intakes of heme iron is being increasingly recognized. So

consumption of some protein rich foods is important but single cell protein and amino-acid fortification of cereal flours are not the answers.

Nutrition Rehabilitation Centres as originally promulgated were not a bad idea, but advocating them, as a strategy that would markedly reduce the high prevalence of malnutrition worldwide was exaggerated rhetoric. An evaluation of Nutrition Rehabilitation Centres in Haiti and Guatemala clearly showed this (7). In the 1960's and 1970's in Haiti, a great deal of outside support including NGO assistance was directed at control of prevalent malnutrition and much of this relied on NRC's. Just as with GM activities, NRC's can only be successful in preventing malnutrition if the educational component is effective, but like GM this aspect has often been its reason for failure.

The report on the evaluation of NRC's in Haiti and Guatemala has these final comments:

- The conclusion can be reached that Nutrition Rehabilitation Centres are, in general, having a favourable effect on the growth of a majority of children while they are being regularly fed at the centre, but that they are having rather small effect on these children after they return home. The reasons for this are probably several and many can only be surmised.
- It is evident that in the centres included in this study the education of mothers is not as effective as might be hoped. This is probably because (a) much more attention by staff is given to feeding and caring for centre children than to education of their mothers; (b) the nutrition and health education is often unrealistic in terms of what is feasible in the homes (i.e. too much stress on animal protein sources rather than legumes) and (c) a significant proportion of families using the centres are too poor to make the necessary improvements in the diets of their children.

But this is not to conclude that for example a well run NRC connected to a crowded hospital cannot be successfully used to shorten hospital stay and reduce costs for children admitted with severe nutritional marasmus or kwashiorkor, and NRC's are still claimed to play a useful role in Haiti (8). But there must be recognition that NRC's will not play the major role in reducing malnutrition.

Nutrition planning in vogue in the 1970's and nutritional surveillance separately in their own way can play relatively important roles for countries aiming to reduce the prevalence of malnutrition. They can for example provide strategies to improve national and household food security and to put in place a response to food crises. But the goals of achieving national food security, so much advocated two decades ago, seem to have been swept aside by GATT, the Uruguay Round, WTO rules, and the embrace of free trade aspects of globalization. Developing countries whose economy is agriculturally based can be prevented by WTO from implementing policies, which favour locally produced foods, and place tariffs on imported cereals. Economists and planners still have an important role to play in assisting with policies aimed to improve food security and reduce poverty. But planning is not a panacea.

By the mid 1980's the nutrition planners influence declined and they were sidelined, not by nutritional scientists and child health specialists but by international economic forces. Supercapitalism arising out of Reagonomics was followed by structural adjustment policies of IMF and a decline in support for social services including health, education and fair wages. IMF policies may have contributed to improvements in the economies of some countries, especially middle income countries. But structural adjustment, and related policies, also contributed to a widening gap between rich and poor, which always aggravates rates of malnutrition. As time went on huge debt repayments were worsening the economies of many countries. In several nations in sub-Saharan Africa, all this has made access to health care and to education more difficult for the poor. And few nutritionists would disagree with the premise that adequate health care for children and female education is fundamental to improve nutrition and growth and development of children.

Applied Nutrition Programmes (ANP's) supported by FAO, WHO and UNICEF in the 1960's and their "reinvention" in a modified form as Joint Nutrition Support Programmes (JNSP's) in the 1990's (9) both had components which are important to improve nutrition at the local level, and their attempts to co-ordinate activities in the areas of health, agriculture, education and social services make much sense. But with the exception of the JNSP in Iringa in Tanzania (10) few really demonstrated that they could substantially reduce the prevalence of malnutrition, including stunting and underweight. Did JNSP's concentrate too much on badly implemented GM and the use of inappropriate nutrition education? Much of the education assumed that the main problem was that mothers were ignorant and only needed information, little education was based in learning from mothers, understanding their difficulties, and appreciating that much of the malnutrition was poverty related. Despite considerable interest in the use of a positive deviance approach, this was little used in the JNSP in most countries.

What should have been participatory action, seldom was. But many of the components of both ANP's and JNSP's have real merit, and participatory actions based on adequate recognition of local situations and culture, could contribute importantly to reducing poor growth and development in children. The introduction of a conceptual framework (9) recognizing that adequate food, health and care are all essential to prevent malnutrition has proven very useful.

The 1990's ushered in a concentration on actions designed to control micronutrient deficiencies (11), and especially the Big 3 namely Iodine Deficiency Disorders; plus iron and vitamin A deficiencies. Recently zinc deficiency has received much attention, but more in the area of research and speculation, rather than programmes and policy. Moving away from the difficulties in attempting to control stunting and underweight, to concentration on micronutrient deficiencies was a very enticing shift for donor agencies, NGO's, academics, and others. This allowed efforts to be made to provide magic bullets, and quick fixes; actions that could be designed in the north for implementation in the south; and there were, and still are hopes of massive financial support. The governments of many non-industrialized countries were easily persuaded to embrace this new focus on malnutrition. It has been very attractive for almost all the actors to appear to be very concerned, and active in controlling malnutrition in developing But in fact while addressing important deficiencies, countries. many are ignoring the major form of malnutrition in these countries, and their underlying causes. These include inadequate intakes of food, problems related to maternal and child care; and an environment conducive to disease, and with poor access to decent health care; all leading to poor growth and development of children.

This is not to say that interventions to control micronutrient deficiencies are not important. The most successful intervention, namely iodination of salt, has been highly beneficial, and when successfully implemented has almost certainly had a major impact on improving psychological development of affected children (12), and in reducing cretinism, one of the most hideous manifestations of malnutrition. Despite all the targets set very few countries have programmes or policies now in place that are likely greatly to reduce nutritional anaemias which remain extremely prevalent and constitute very important health problems.

To what extent does current concentration on reducing micronutrient deficiencies, which are now labelled "hidden hunger", in fact lessen efforts and actions to reduce overt hunger, and the important causes of poor growth and development? How much is this diverting funds, professional expertise, and NGO attention to micronutrient deficiency control and away from important efforts to reduce the prevalence of poor growth and development?

Promoting better growth

Through almost all these years, in one form or another, growth monitoring (GM) of children has been practiced, and in some countries still constitutes the major intervention aimed to reduce malnutrition. It is often supported by UN and bilateral agencies, by NGO's and by national governments (14). There are many other different actions that UN agencies, NGO's and governments can, and do take to promote better growth of children. However for the last several decades many have concentrated on GM and the main assistance from agencies has been the provision of weighing scales, growth charts, and support for weighing and charting. Very often then, GM concentrates on weighing and charting, with very little attention to growth promotion, which should be the main objective. GM has a long history of enthusiastic advocacy, despite the fact that there is little research to prove its effectiveness as commonly practiced. Growth promotion using information from the mother, the community and local health workers has been relatively ignored. There have often been assumptions that the main problem is that the mother is lacking more in knowledge, and in desire and ability to care, rather than lacking in resources, support and time; and that she has good access to reasonable health care, when all too often this is not true. The existing health care system may be dysfunctional, and now because of structural adjustment there may be charges that she cannot afford, so access to health care for mothers and children is even more problematic

This Colloquium on promoting growth and development of underfives provides an opportunity to examine critically this particular intervention because unlike some others, to which I have alluded; GM is focused on growth failure as the major nutritional problem.

Rightly or wrongly I attribute the beginning of the GM movement to the early work of David Morley in Nigeria leading to the innovative Ilesha growth chart (2). But undoubtedly for many years before that, paediatricians were weighing babies and following their weight gain, and giving advice based on that. But I expect that the way Morley used GM in Ilesha, and elsewhere, was very different from the rapid weighing and charting that has become the commonest form of GM practiced for the last three or more decades, and of which many of us have been critical. We emphasize that GM should be a preventive, promotive and pre-emptive strategy to assist

optimum growth and development and to prevent growth retardation, not mainly to cure it. It should concentrate on maintaining good growth, and not as is often the case be used mainly for rehabilitating children with growth failure.

In 1991 in a chapter on Growth Monitoring and Promotion (15) I wrote:

Growth monitoring, then, is a strategy to empower mothers to maintain good nutritional status in their children and to prevent growth retardation. Much of the action should consist of positive reinforcement rather than corrective action. As a diagnostic exercise it should be as much to find out what mothers are doing right as what is going wrong. Of course it is also to detect early growth faltering, to find the likely reasons for this, and to suggest to mothers corrective actions which are realistic and which they might try. It is likely to be relatively unsuccessful if used mainly to try to "correct" the growth of older children who are moderately or severely stunted, especially if these children are not wasted.

In all cases meaningful involvement of mothers should be the heart of a growth monitoring and promotion programme. It is a participatory exercise; it involves dialogue and discussion, not lecturing and scolding; and mothers should help in decision making, for example, about the location, the hours, and the organization of GM sessions. Mothers need also to be consulted about such matters as the need for privacy and confidentiality, whether it is appropriate in their culture to weigh children nude or clothed.

These views of growth monitoring and promotion present the concept of the author and others of what it should be, rather than what it usually is in practice in countries in Africa, Asia, and Latin America in 1988. This author continues to see growth monitoring in action, which ignores these principles. Too often growth monitoring is used mainly as a weighing exercise, advice is given only to mothers whose children are doing badly (this often consists of public scolding).

Subsequently we conducted a community intervention trial in 12 villages in Tamil Nadu, India to evaluate the benefits of growth monitoring (16). The villages were divided into six "growth monitoring package of intervention villages (GMP)" and six "non-growth monitoring package of intervention villages (NGM)". In the GM villages the health workers used growth charts to assist in educating mothers, and in the non GM villages mothers received advice and education without the benefit of a growth chart. After

30 months of interventions similar improvements in growth were seen in GM and NGM children. There was no additional benefit from the growth monitoring.

Assessment of growth faltering

It is also important to consider what anthropometric measurements are best to judge the adequacy of growth. In the decades of the 1950's and 1960's nutritionists relied almost entirely on young children's weight for age, and classifications based on this, such as the Gomez classification were widely used to grade malnutrition using this parameter, modified only by Bangoa to take account of oedema. But 30 years ago we pointed out that using height, as well as weight and age, allows for a better classification system (17). Waterlow (18) in his seminal paper entitled "Classification and definition of protein-calorie malnutrition" gave us credit for this, stating:

"As Seoane and Latham pointed out, weight for height is an index of current nutritional status; height for age gives a picture of past nutritional history. Since these parameters measure different things, it is desirable that changes in them be distinguished by different words."

We suggested that with data on weight, height and age malnourished children could be divided into three groups and that height deficits provided a measure of the duration constituting chronic malnutrition, now termed stunted; second children with low weight for height, we first termed acute malnutrition, which Waterlow termed wasted; and third children who we classified as having acute-on-chronic malnutrition have come to be termed children who are both stunted and wasted.

Some 30 years later, despite widespread acceptance of these classifications we find that in most countries GM is practiced based only on weight for age just as it was done in the 1960's and 1970's. Why?

A very important consideration at this Colloquium surely should be to answer that question. For over 30 years many of us have been pointing out that interventions were much more likely to reverse malnutrition in wasted children because of the acuteness of the condition, than in stunted children because of the chronicity. But GM using only weight for age does not distinguish these two forms of malnutrition. It is recognized that interventions may prevent the stunting from becoming worse.
For the young child regularly attending an under-five clinic, or GM post, there is value in following increments in weight. But unless, possibly at broader intervals (perhaps every three months during the first year and every six months after one year of age) the child's length or height for age is recorded, advice given and actions taken may be inappropriate. It is recognized that length and height are more difficult than weight, to measure accurately in a young child.

Newer evidence (19) shows that stunting often begins in the first three months of life (and of course prenatally), and deterioration often continues for about 18 months. So interventions need to begin prenatally, then concentrate on the early part of life, but continue for three or four years because faltering often occurs until that age. Wasting tends to begin usually after three months of age, but in most parts of the world becomes more prevalent, or severe, only up until about 18 months of age. Interventions, which are more curative, than preventive, may be appropriate for children with wasting.

An important question is whether growth promotion, without weighing and charting, should now be an important strategy. This needs to focus on mothers, families and young children in the community. Activities that can reduce low birth weight, need a high priority. Most interventions are unlikely to be successful unless there is some understanding of local cultures, community resources, and mothers' knowledge and attitudes. What are the child rearing and caring practices; and what are the dietary, socioeconomic, behavioural, health, infant feeding and other factors likely to influence growth and development of the young child? How much action should be directed at the individual mother and child, and how much be aimed at the community?

IMCI (20) (the Integrated Management of Childhood Illness) initiated by WHO more recently is being widely promoted by WHO and UNICEF in developing countries. To me it seemed unfortunate that WHO adopted this term, which alludes to dealing with childhood illness, rather than child health and that it is directed at reducing morbidity and mortality rather than protecting health. Can it be reoriented to be more preventive rather than curative? IMCI includes weighing and charting, and apparently this is being done in the traditional way of recognizing and treating growth retardation, rather than concentrating on preventing this. Periodic assessment of length or height rather than only weight would help direct interventions in a better way.

Inequity -- the root cause of malnutrition

The indisputable fact is that in the last 30 years there has been a widening gap between rich and poor, nations and people (21). This growing inequity should be unacceptable and is the root cause of malnutrition. Without effective actions designed to improve equity, stated goals to reduce undernutrition are empty promises. The inequity is not simply a widening gap in incomes, but gaps in access to education; to reasonable health care; to food security; to information; to adequate water; to life in a reasonably sanitary environment; and more. And the inequity may in part be based on inequity related to gender and even to social background or caste (22).

Targets promulgated at international conferences, and approved by governments north and south cannot possibly be achieved without improving equity and addressing some of its external causes such as globalization; the world economic disorder; the increasing power of transnational corporations, including concentration into global oligopolies; the negative impact of structural adjustment and WTO rules; and the resulting weakening of national governments. Inequity is not just another word for poverty. Kerala, Sri Lanka and Cuba provide examples of places where in different ways a greater level of equity, despite prevalent poverty has been associated with lower rates of infant and young child mortality, less undernutrition, less illiteracy, better health, and reduced gender bias than in comparable neighbouring areas or countries with more inequity, but less poverty. In most of these parameters there are striking differences for example between Kerala and Maharashtra; Sri Lanka and India; and Cuba and much of Central America.

We also make a distinction between equity and equality. Attempts to improve equity seek to reduce gross inequalities. The late President Nyerere of Tanzania put it this way when he stated "No man needs to live in a palace, no man should live in a hovel" (21). Where are the statistics on the degrees of equity and inequity in different countries and where are goals and targets to reduce inequity?

So-called free trade and globalization have been offered as the answer to improving the economics of poor countries. But almost everywhere globalization has increased inequity, and has also reduced the ability of poor nations to achieve national or local food and nutrition security. It is important that nutrition scientists study these issues and work with other activists to reduce inequity, to oppose harmful aspects of globalization (while supporting universalisation of human rights) and to reign in the power of TNCs. Activism in the past has achieved some successes, most notably in countering the unethical promotion of breastmilk substitutes (22).

The 1999 Human Development Report describes the WTO as: "the first multilateral organization with authority to enforce national governments' compliance with rules". In Seattle a public outcry slowed WTO's attempts to strengthen its own power, to the detriment of developing countries. If we as nutritionists and health workers genuinely wish to strive for major reductions in undernutrition and anaemia we need to be active in this new coalition seeking to tame globalization and greatly improve equity; to change the unfair economic order and reduce the power of TNC's and to promote the universalisation of human rights including rights to adequate food, health and care.

HIV/AIDS and nutrition

In any discussion related to promoting growth and development of children under five as we enter the 21st century, there is a need to recognize that the world pandemic of HIV/AIDS will have an influence. Although the major focus now is on sub-Saharan Africa, there will be far more cases of HIV/AIDS in Asia, than in Africa before the end of this decade.

HIV/AIDS can influence child growth and development in many ways. First the relationship between malnutrition and AIDS is well recognized (25). In Uganda many years ago AIDS was known as "slim disease" because those with the disease became wasted. The nutritional status of individuals is compromised by infection, and the progression of the disease may be influenced by poor nutrition. Actions to improve nutrition may increase duration of survival as well as the quality of life of AIDS sufferers.

But in terms of growth and development of the young child there are two different loci with which we need to be particularly concerned. These are :

(1) HIV infection in the young child, usually resulting from mother-to-child transmission (MTCT); the impact of HIV, or fear of HIV, on breast feeding and other child feeding practices; and the impact of a mother sick with AIDS or who dies of AIDS on the growth of her young child. Because breast-feeding is so important in supporting good growth and in reducing infections, it is of great importance that it not be undermined. HIV can be transmitted from mother to child through breast-feeding. But two-thirds of women with HIV do not transmit the virus to their infants, and of those that do, by far the majority of infections are contracted in utero or during childbirth, and not via breastmilk. For most underprivileged mothers in Africa even if HIV positive, the risks in terms of morbidity and mortality are greater through not breastfeeding, than through breast-feeding (26) especially exclusive breast-feeding for six months. Yet because of exaggerated concerns regarding transmission through breastmilk, and an underestimate of the risks of not breast-feeding we see a massive spillover effect with much less support for breast-feeding than there was before. The vast majority of women in Africa do not know their HIV status, and the UN guidelines clearly state that breast-feeding should still be protected, supported and promoted.

(2) The impact of HIV/AIDS, in general, on family, local, national and even international factors which may influence nutritional status of young children in developing countries. HIV/AIDS is overburdening already deficient health services; families and communities are losing their most productive members, and their breadwinners; agriculture in some countries is negatively impacted by AIDS; there is a huge increase in young orphans; teachers, trained health workers and others vital to maintain basic services are dying and not being replaced; and so on.

So the efforts to reduce malnutrition in those countries where HIV is prevalent will be hampered, and this impact cannot be ignored.

Inappropriate use of development funds

We need to examine honestly, and to be very concerned about, what happens to funds allocated to development activities, be this to improve growth and development; to raise health levels; or more generally to reduce poverty. Would I be far of the mark if I suggested that often 80 percent of the money is spent in the donor country; on high salaries, expensive travel including luxury hotel accommodations; on conferences and workshops where participants are housed and fed unnecessarily well; on high priced foreign and local consultants; and so on? Often as little as 10 percent of the funds allocated actually reaches the beneficiaries. This seems often to be the case with projects controlled by UN and bilateral agencies; large NGO's; international academic programmes; and other development groups. Criticism of the "development set", in which almost all of us are involved, has been voiced for a long time, but little seems to have changed. This has surely contributed to the very limited success in reaching targeted goals to reduce malnutrition in non-industrialized countries, and poor communities.

Conclusions

In my review of historical trends in nutrition policies and programmes, am I being negative and cynical, and is my message one of pessimism? I think not. I am actually hopeful, and optimistic about the future. We all know that there is enough food grown adequately to feed the whole world population now, and even with population increases this will remain so. I believe that most human beings are good, decent and caring. I believe we have available actions that if adopted, and implemented by communities, could greatly reduce poor growth and development of young children. This would be much more likely to happen if appropriate policies and actions were taken at the national and international levels.

In 1961 in the village of Maposeni (27) and in 2001 on the small Indian Ocean island of Chole – both in Tanzania, I have involved myself deeply in the field doing what would now be termed participatory action research attempting to help communities help themselves using rather broad approaches including health, agriculture, education, communication and social sciences to improve nutrition, by improving the quality of life of rural people. Some of the types of interventions discussed in this paper are included in actions to reduce malnutrition and improve health in Maposeni and Chole.

In terms of my concern for the international economic order and the widening inequity I take a rather activist, or participatory approach be it at the county level or at the international level. In rural Tompkins County in upstate New York there are opportunities to work in favour of better wages for working people; activities in areas of equity and peace; strong Jubilee 2000 efforts to reduce third world debt burden; participation in a local food co-operative, in Eco-village housing; in supporting a local currency and local businesses. At the international level through writings and at conferences or other fora activities include pleas for greater equity and social justice; continuing work to prevent the promotion of breastmilk substitutes; to ensure adherence to the WHO Code; and to prevent manufacturers of breastmilk substitutes from taking advantage of the AIDS pandemic to peddle their products.

I am optimistic that before very long there will be a major revolt against the current economic order. This is because supercapitalism has gone too far; TNC's have become too powerful, and too monopolistic; and WTO has developed rules that greatly weaken national governments. So although strongly in favour of democratic institutions and the market place we have seen a distortion of the free market system.

I hope that nutritionists can join in the building coalition with trade unionists, small farmers, oppressed indigenous peoples; women in societies where they lack certain rights, ecologists and environmentalists, human rights activists, and others. Such a coalition using democratic means could in the foreseeable future turn things around for the betterment of humankind.

References

- 1. Latham MC. International child nutrition. NU News on Child Health Care in Developing Countries. 1993;7:34-41.
- Morley D and Woodland M. See how they grow: Monitoring child growth for appropriate health care in developing countries. *London: MacMillan Press*, 1979.
- 3. Latham MC and Beaudry M. The impact of transnational corporations on food consumption and nutrition in Africa. In: "Not by Bread Alon". *Toda Institute, Honolulu, Hawaii*, 1999;222-243.
- 4. Latham MC and Preble EA. Appropriate feeding methods for infants of HIV infected mothers in sub-Saharan Africa. *Br Med J.* 2000;**320**:1656-60.
- 5. Pelletier DL, Frongillo EA, Habicht JP. Epidemiologic evidence for a potentiating effect of malnutrition on child mortality. *Am J Public Health*. 1993;**83**:1130-33.
- 6. McLaren DS. The great protein fiasco. *Lancet.* 1974;**2**:93-96.
- 7. Beaudry-Darisme M and Latham MC. Nutrition rehabilitation centres -- an evaluation of their performance. *J Trop Pediatr* Environ *Child Health.* 1973;**19**: 299-332.
- 8. Gedeon MA. From mother craft centres to nutritional foyers -- five decades of nutrition surveys in Haiti. Abstracts 17th International Congress of Nutrition, Vienna 2001, Abstract 3.14.012.
- Jonsson U. A conceptual approach to the understanding and explanation of hunger and malnutrition in society. In: "Hunger and Society 1988". Cornell International Nutrition Monograph Series Number 17:20-43. *Ithaca, New York.*
- Ljungvist B. The making of a nutrition programme. In: "Hunger and Society 1988". Cornell International Nutrition Monograph Series Number 19:312-332. *Ithaca, New York.*
- 11. World Bank. Enriching lives: overcoming vitamin and mineral deficiencies in developing countries, 1993.
- 12. Hetzel BS. Iodine deficiency disorders (IDD) and their eradication. Lancet. 1983;**2**:1126-29.
- 13. Morley D. Prevention of protein-calorie deficiency syndrome. Trans Roy Soc Trop Med Hyg. 1968;62:200-208.
- Rohde JE. Beyond survival: promoting healthy growth. Ind J Ped. 1990;55:S3-S8.
- 15. Latham MC. Growth monitoring and promotion. In: "Anthropometric Assessment of Nutritional Status". *Philadelphia:Wiley Liss*, 1991;287-299.
- George S, Latham MC, Abel R, Ethirajan N, Frongillo EA. Evaluation of effectiveness of good growth monitoring in south Indian villages. *Lancet*.1993; 342:348-52
- Seoane N and Latham MC. Nutritional anthropometry in the identification of malnutrition in childhood. J Trop Pediatr Environ Child Health. 1971;17:98-104.

- Waterlow JC. Classification and definition of protein-calorie malnutrition. Br Med J. 1972;566-69.
- 19. Rivera J, Ruel MT. Growth retardation starts in the first three months of life among rural Guatemalan children. *Eur J Clin Nutr.* 1997:92-96.
- WHO. The Management of childhood illness in developing countries: Rationale for an integrated strategy. *Geneva, Switzerland*, 1997.
 Bloom BR. The spread of depression: public health trends. *International Herald*
- 21. Bloom BR. The spread of depression: public health trends. *International Herald Tribune*, 1999.
- 22. Latham MC and Beaudry M. Globalization and inequity a determinant of malnutrition: a clear need for activism. *Ecol Food Nutr.* 2002 (In press).
- 23. Korten DC. When corporations rule the world. San Francisco: Kumarian Press Inc, 1995.
- 24. Nyerere J. The economic challenge: Dialogue or Confrontation? In: "Five Years of CCM Government". Tanzania Government Documents. *Dar Es Salaam*, 1992.
- 25. Piwoz EG, Preble EA. HIV/AIDS and Nutrition. Washington DC USAID Sara Project, 2000.
- Latham MC. Breastfeeding reduces morbidity -- the risk of HIV transmission requires risk assessment -- not a shift to formula feed. Br Med J. 1999; 318: 1303-4.
- 27. Robson JRK, Carpenter GA, Latham MC, Lewis P. The district team approach to malnutrition. *J Trop Paediatr.* 1962;**8**:60-69.

HOW THE GROWTH AND DEVELOPMENT PROGRAMME WAS PUT IN PLACE IN FLANDERS AND WHAT WERE ITS DEVELOPMENTS OVER TIME

Nadine De Ronne¹

Life expectancy improved for children and adults in the 19th century. Infant mortality was still high at the beginning of the 20th century, due to bad hygiene in preparing bottle-feeding. Breastfeeding was seldom administered. Private initiative started up in several cities where physicians gave advice to young mothers promoting correct hygiene procedures in the care for children, promoting breast-feeding, and giving advice in preparing bottle feeding. These were the first baby well clinics.

These initiatives were centralized in the 'National Ligue for Child Protection' (1904) and financially supported by the National Health Department from 1908.

By those means other initiatives started: the number of infant welfare clinics increased, meals were prepared in large kitchens and offered to sick and weak children, and to pregnant and breastfeeding mothers, prenatal consultations tried to monitor pregnant women at risk, there was day and night care for children of working mothers, orphanages could be opened, and there were organizations fighting child abuse and neglect (f.i. the Brussels Société Protectrice des Enfants Martyrs).

The Nationaal Werk voor Kinderwelzijn (NWK) was established in 1919 as a public organization with the epidemiological aim of diminishing infant mortality by means of preventive advice. Besides the executive board and the administration staff there was a controlling medical committee supervising the items physicians had to deal with in the infant welfare clinics. Every child under age three could come to the consultations at the clinics. Nurses performed home visits to registered families to check if the advice was well understood and implemented. Families attending infant welfare clinics obtained material advantages on a regular basis: bottle feeding and vitamin supplements were distributed, baby linen was sold at low prices.

During the first decades of the 20th century food and hygiene were the most important issues to control for in infants, children, pregnant and breast-feeding mothers. Postnatal and infant mortality decreased, owing to a combination of the intensive work of

¹ Kind en Gezin, Belgium

the NWK, better water supply provisions, sanitation of housing and social security.

Since 1930 medical knowledge progressed and the financial and social situation was improving. Preventive care changed: hygiene and food were no longer the most important issues. A vaccination programme against variola was implemented. Children from 3 to 6 years old could attend at separate sessions in the infant welfare clinics if not sufficiently followed by the school medical service. Because of the high postnatal mortality rate due to periand postnatal complications, prenatal monitoring clinics tried, by means of supplying preventive advice, to make pregnant women aware of the importance of good prenatal monitoring. There was a close co-operation with maternity hospitals in order to refer women if any problem was found. A social investigation in 1936 showed poverty was due to incompetence of young mothers to prepare meals, and to a failing basic hygiene. As a consequence cooking, sewing, housekeeping, and child welfare classes were given to all volunteers.

During World War II (1940-45) the nutritive conditions were bad because of an unbalanced feeding. There was a lack of fresh milk. Low fat milk was used. Because of the deficient growing parameters butter, sugar or cereals were added, which was dangerous because of its inappropriate composition for infant feeding and the lack of hygiene during manipulation. Fruits and vegetables were rare and expensive. Epidemic outbreaks of pertussis, diphtheria, measles, influenza, impetigo and scabies threatened children. Preventive support was very important for infants and for young children.

In the 60's there was a reorientation in the activities to vaccination coverage, infection tracing, developmental follow-up, and family relationship. By that time paediatrics had become a full discipline.

As a consequence of the institutional reform of Belgium the role of the NWK was taken over by Kind en Gezin (Child and Family, 1/2/1987) in Flanders and by the Office de la Naissance et de l'Enfance (ONE) in the southern part. The activities of both organizations were enlarged but they are still related to preventive child support. In the meantime birth rate was sinking, there were fewer children per family and day care had become a primary concern because more parents were both working. Problems of the multicultural society, behavioural problems, child neglect and maltreatment, uncertainty of young parents gave the input to reorientation.

Kind en Gezin activities start from a concept of "good health" as the combination of normal growth, normal development, absence

of illnesses, social adaptation and emotional stability. The purpose is to promote infant welfare in Flanders. Advice concerning physical health, family relationships, psychological support and pedagogic advice enable us to make prevention a global concept. Longitudinal follow-up in the different disciplines can teach us something about the child in its environmental and social context.

Preventive family care anno 2001 is built on what was prepared last century. The aim of preventive childcare evolved from reducing infant mortality by means of implementing better hygienic conditions into the monitoring of every child in its entire development.

In the setting of the organization Kind en Gezin, preventive care service is possible for all families with young children up to the age of three. It starts during pregnancy with information sessions, prenatal consultations in co-operation with maternity clinics, maternity visits to explain the need for regular follow-up for every infant, and is continued by home visits by nurses, consultations by a physician and psycho-social-pedagogical advice by the nurses at the clinics, telephonic permanency by nurses every working day at district centres.

In the most deprived areas of Flanders particular initiatives have been set up. Special infant welfare clinics try to offer a wide range of made-to-measure services containing more than the basic package in both individual and group terms both before and after Because of the multicultural population intercultural cobirth. workers are employed who act as interpreters and bridge cultural differences. Day-care is needed more than ever because of changing working conditions (in shifts, at night) and because of the fact that in our region it is no longer a general rule that grandparents take care of their grandchildren. Professional daycare is provided by private or registered child minders, day nurseries and out-of-school care initiatives. Confidential Child Abuse Centres are located in every Flemish province and operate as points for reporting child abuse, provide initial assistance, and make a diagnosis so as to refer the children later on. These centres are responsible for co-ordinating and monitoring social work and for raising the awareness of the problem.

Preventive support includes screening programmes based on evidence based research: such as postnatal metabolic screening and the neonatal hearing-screening programme (AABR). A vaccination programme set up by the government is implemented everywhere in the clinics. Physicians working in the clinics are paediatricians or general practitioners with extra training in youth health problems.

Because of the multidisciplinary approach the staff consists of medical doctors, pedagogues, psychologists responsible for

updating on issues nurses and physicians are dealing with. Medical knowledge remains a very important issue in the follow-up of every infant, but it can be integrated with other disciplines. Medical staff is present at all levels in the organization: central administration, provincial committees, and for the quality coordination in preventive consultations and in day care.

All this together is the way we try to monitor every child in its growth and development in the broader sense of the word.

References

- 1. Velge H. De bedrijvigheid van het Nationaal Werk voor Kinderwelzijn tijdens vijf en twintig jaar (1915-1940). *Drukkerij van het Office de Publicité: Brussel.*
- 2. Velge H. De bedrijvigheid van het Nationaal Werk voor Kinderwelzijn tijdens de oorlog (1940-1945). Drukkerij van Office de Publicité: Brussel.
- 3. Vandenplas Y. Witboek van de Kindergeneeskunde. AZ VUB Laarbeeklaan 101, 1020 Brussel.
- 4. Regionale hoorzittingen over het Strategisch Plan Preventieve Kinderzorg, 1995.
- 5. Syllabus Preventieve Kinderzorg, Kind en Gezin, 1996.
- 6. Knops J, Vantongelen E. De historische evolutie van de zorg voor het jonge kind in het kader van de raadplegingen van het NWK/ Kind en Gezin (opgenomen in symposiummap 08-10-1988, UZ Gasthuisberg, Leuven).
- Blancke L. De preventieve kinderzorg in het consultatiebureau: overbodig of waardevol ? College Medisch Adviseurs, 1990.
 Pelckmans. Er is leven na de dood. Tweehonderd jaar gezondheidszorg in
- 8. Pelckmans. Er is leven na de dood. Tweehonderd jaar gezondheidszorg in Vlaanderen. *Kapellen*, 1998.
- 9. A search for the evidence supporting community paediatric practice. Arch Dis Child. 1999;**80**.

LET'S MOVE GROWTH MONITORING OUT OF LIMBO

David Morley¹, Mike Elmore-Meegan²

Early history of growth monitoring

In the late 50's and early 60's a longitudinal study of children growing up was undertaken in the village of Imesi-Ile in Nigeria. Parallel to this research the concept of a preventive and curative Under-5's clinic was being developed (1). Central to both of these was the introduction and universal use of a simple large growth chart on which, at every monthly attendance, the weight for age of the child was recorded. Two innovations helped to make these charts more successful.

- The child's age was recorded using a calendar system. The 'clerks' were weighing between 100-200 children every morning and calculating the age of each child would have caused inordinate delay. Instead the months starting with the child's birth month were written in spaces at the bottom of the chart (Figure 1).
- A home-based record. The size of the population seeking good primary health care in a developing country makes any attempt at filing records financially impracticable. In practice, if mothers are encouraged to see the home based record as their passport to primary health care, losses were shown to be far less than for records filed in a clinic.

Worldwide spread in the 70's

Growth monitoring, oral rehydration, breast feeding and immunization ('GOBI') were all involved in the early attempts to develop primary child health care world-wide with the encouragement of UNICEF, WHO, Governments and NGO's. Considerable investment was made in weighing scales and training of staff. In many countries every child was provided with a growth chart and weighing of children became a universal symbol for primary child care depicted on stamps and in the media.

¹ Institute of Child Health, University College, University of London.

² ICROSS, Kenya

Figure 1: The objective of growth monitoring is to ensure adequate growth, this is a sign of a healthy child

The 1980's: A period of evaluation

The success of health care was evaluated in terms of cost input, and outcomes in terms of improved nutrition and decreased child mortality. Immunization and oral rehydration were shown to have a dramatic impact on the nutrition of children and their mortality rates. Growth monitoring, although successful in limited NGO situations, could not be shown to have an effect when spread nationally (2).

The 1990's: Growth monitoring thrown into limbo

Examination of programmes and plans for improving nutrition of children in disadvantaged countries made by WHO, UNICEF, FAO and major NGO's rarely now include any mention of growth monitoring (3). However, children are still weighed worldwide and some attempt is made to complete growth charts. The general experience is that these charts are not used for decision-making, and as a result are of limited value.

Discussions with those concerned with primary school education in developing countries will help us to understand why problems exist in completing weight charts and even more in their interpretation. Psychologists suggest that graphical representation of number, such as a line graph is more easily learnt by children of primary school age. However, graphs are not taught in most primary schools in disadvantaged countries and are probably a subject beyond the ability of the teachers. Piaget (1896-1980) suggests that it is one of the more difficult concepts in learning. We need to appreciate that the understanding of graphs, if achieved, is only likely to take place during periods of higher education.

Experience in the past (4) showed that a proportion of postgraduate doctors attending a course in London had difficulty in completing a weight chart. If it can be accepted that primary school teachers are unable to teach the creation and meaning of line graphs, it is not surprising that health workers, even if they understand it themselves, can not pass this on to mothers. If we can accept that **the creation and interpretation of line graphs is part of higher education**, then it is not surprising that growth monitoring as practiced so far, has failed.

What should growth monitoring achieve?

Growth monitoring should achieve adequate growth and normal brain development. In many countries over half the children and adults are stunted in their growth. The vast majority of this stunting commences before birth and in the first year of life, although it is rarely recognized until later. Some of this stunting may have its origin in the insufficient milk supply from the undernourished mother. However, the major part is due or exacerbated by the low calorie density of weaning foods often associated with a low intake of micronutrients. The first year of life, when growth may falter, is also the period of rapid brain growth (Figure 2). Fortunately most of the infants are breast-fed and receive the essential nutrients for brain growth found almost exclusively in breastmilk. While the effect of poor body growth on the brain can be debated there is no doubt that undernourished infants with a poor calorie intake will reduce their physical activity at a time when this activity is needed for the child to participate in the stimulating environment now considered so important for success in formal education at a later age (5).

Growth monitoring should ensure adequate growth and is without question the only practical way of identifying faltering in growth within one or two months of its occurrence. If possible this should be immediately apparent to the mother and family who are those most capable of taking remedial action. Figure 2: During the first two years of life, the human brain grows rapidly and cells intercommunicate

A simple technology

In the successful eradication of smallpox, the introduction of a simple technology the bifurcated needle was considered to have played a major part.

Similarly, it is hoped that a simple technology a spring that stretches 1cm/kg will give new life to growth monitoring. This spring mounted in the Direct Recording Scale stretches up the child's growth chart, the kilogram lines on this chart are one centimetre apart.

The vast majority of children in developing countries are weighed in a busy clinic situation with a scale that uses a dial. The mother sees the needle of the dial moving, the health worker taking a reading and making the next entry on her child's growth curve. Few mothers will understand this. The direct recording scale is

256

used away from a clinic and close to the home. In the presence of the family, the mother places her child into the trousers below the scale and immediately sees the spring stretching up her child's growth chart. She herself, through a hole in the pointer at the top of the spring, introduces the next point on her child's growth curve.

The major studies on the use of this scale have been undertaken by one of us (M. E-M.) in Kenya. The Maasai mothers come to understand child growth, why a child should be weighed, and identify from several charts the one chart showing normal growth (6). Further studies suggest that not only the mother but the grandmother, who in so many societies is the decision-maker, and the older daughters who are the future mothers, come to a similar level of understanding (7). The disadvantages and advantages of these two approaches to weighing infants are set out in the figure (Figure 3).

Figure 3: A comparison of the dial scales with the Direct Recording Scales

Locally made scales

The mention of weighing scales implies for most of us an expensive factory product. With the concept of the direct recording scales, all that is needed is a spring that stretches 1 cm per kilogram. These have an indefinite life and unless removed from the scale and over-stretched will remain accurate. There is no reason why these scales cannot be made locally from wood this will further reduce the cost. In general terms the costs including postage and packing, are likely to be: dial scales US \$80, direct recording scale US \$25, spring and plastic attachments US \$12. Attempts in two areas are being made to create small income generating projects by making scales locally.

Summary

In all societies there is a move to take primary health care more into the community and involve community participation. Growth monitoring is still considered a major part of health care in many countries, but so far few have considered involving community members in undertaking growth monitoring. Nor is this likely to be successful if dial scales are used due to their expense and the complexity of creating and interpreting a growth chart. Evidence is available that if the mother is involved in weighing her child and plotting her child's weight gain using a Direct Recording Scale, she and other family members comes to understand what she is doing. If faltering occurs research shows she may recognize it and take immediate action to improve her child's intake of food.

References

- 1. Morley D. Paediatric Priorities in the Developing World. *London: Butterworth*, 1973.
- 2. Nabarro D, Chinnock P. Growth Monitoring: Inappropriate promotion of appropriate technology. *Soc Sci Med.* 1988;**26**:941-948.
- 3. Morley D, Elmore-Meegan M. Growth Monitoring a forgotten subject. *FAO: Food Nutrition and Agriculture.* 2000;**27**:14-18.
- 4. Morley D. Will growth monitoring continue to be a part of primary health care? *S Afr Med J.* 1994;July Suppl:15-16.
- 5. Dobbing J. Malnutrition et development du cervaux. *La Recherche*. 1976;**7**:193-145.
- 6. Davies T, Parkin J. Catch-up growth following early childhood malnutrition. *East Afr Med J.* 1972;**49**:672.
- 7. Meegan M, Morley D et al. Child weighing by the unschooled: A report of a controlled study of growth monitoring over 12 months of Maasai children using direct recording scales. *Trans R Soc Trop Med Hyg.* 1994;**88**:635-637.

8. Meegan M, Morley D. Growth Monitoring: Family participation: Effective Community Development. *Trop Doct.* 1999;**29**: 23-27.

Direct Recording Scales and the Springs and further information available from Teaching Aids at Low Cost (TALC), PO Box 49, St Albans, AL1 5TK, UK. E-mail Talc@btinternet.com.

EVALUATING THE QUALITY OF GROWTH MONITORING AND PROMOTION PROGRAMMES IN CÔTE D'IVOIRE: MATERNAL SATISFACTION AND NORMATIVE ASSESSMENT

Férima Coulibaly¹, Hélène Delisle², Slim Haddad³

Introduction

Growth monitoring and promotion (GMP) is recognized as a key strategy for the prevention of child malnutrition by many, including UNICEF (1). However, the relevance of GMP is regularly challenged (2,3). Yet with appropriate training and supervision of personnel, and with community participation, positive impact was reported, for instance, in Tanzania (4), in India (5), and in Costa Rica (6). This suggests that GMP is likely effective provided it is well done.

In our study in Côte d'Ivoire, we assessed quality of four GMP programmes using two sets of methods: a normative approach, and evaluation through perceptions and satisfaction of mothers. The impact of programmes on children's nutritional status was not assessed. Our basic assumption was that provided programmes met quality standards and mothers were satisfied, they would have an impact on children's health and nutrition. The objectives were to identify the mothers' criteria to judge the quality or GMP and compare these with our normative criteria, to assess the quality of programmes according to norms and to mothers' satisfaction, and to suggest means of improving GMP programmes on the basis of observed strengths and weaknesses. We hypothesized that the quality of human relationships was the main criteria for mothers, and that assessing mothers' satisfaction would give a good indication of overall programme quality since all dimensions of quality are interrelated. This paper presents the findings on mothers' satisfaction and some results of the normative evaluation. More detailed findings on programme quality based on accepted criteria of good practice of GMP (5,7) are published elsewhere (8).

¹ MD, Department of Nutrition

² PhD, Department of Nutrition

³ MD, PhD Department of Health Administration, Université de Montréal, P.O. Box 6128, Downtown Station, Montreal H3C 3J7, Canada

Methods

Study Design and Sites

A qualitative approach was used, with a multiple case study design (9). Each of the four GMP programmes represented a case. Three of the 4 GMP programmes were located in poor districts of Abidjan, and the last one was in a near-by rural area. Two programmes (one urban and the only rural one) were in government health centres; the other two were run by NGO's (one catholic mission and one civil organization).

Conceptual Framework and Study Variables

The same conceptual framework was applied to the normative and perceptual quality assessment (see Figure 1).



Figure 1: Conceptual Framework

261

Mothers' evaluation criteria and satisfaction were examined in connection with the four dimensions used in the normative evaluation of the GMP programmes, namely organization, which encompasses physical structure and equipment, technical procedures, interpersonal relations, and knowledge and skills of personnel, which are partly reflected in technical procedures and interpersonal relations. These are seen as major determinants of GMP quality and of GMP benefits perceived by mothers. Mothers' satisfaction criteria were identified on the basis of their expectations vis-à-vis GMP, and their criticisms.

Data Collection Methods

Focus groups and in-depth individual interviews with mothers were conducted to explore their quality criteria and their judgement on the GMP programmes. Individual satisfaction level was only assessed during individual interviews. Mothers attending GMP activities, as well as those not attending, were invited to take part in the study. The principal investigator spent six weeks in each of the four study sites. Four focus groups and eight individual interviews with mothers attending GMP, and two focus groups with nonattending mothers, were conducted in each site. Mothers of 0-36 month-old children were invited to join the study as they arrived for GMP. They had to give their informed consent, after being explained the purpose of the study. The first eight mothers were recruited for individual interviews. For focus groups, mothers were divided in two groups according to age (15-29 and 30-45 years) in order to allow for more open discussion. Mothers not attending GMP were recruited in the community with the help of attending ones. Individual home visits were again paid to all participants before the interviews to gain their trust and to insist on the confidential nature of the information they would provide. Language spoken was another grouping criterion, but there was no need to differentiate according to socio-economic status. All lived in rather poor areas and they had limited or no schooling. For the normative assessment, we observed several GMP sessions using a detailed checklist of good practice indicators. Each GMP officer was observed at least twice, on random days, for a total of 23 observations. Individual interviews (n=12) with personnel were conducted, using a semi-structured questionnaire to assess their knowledge, attitudes and practices.

Data Analysis

Interview transcripts were first analyzed to identify the main theme constructs discussed by the respondents (10), based on the

interview questions and on the conceptual framework of the study. Inter-analyst reliability was 65% first, and after concertation, it reached 88%. Intra-analyst reliability coefficient was 90 %.

The themes and sub-themes referred to the following topics:

- Mothers' criteria of GMP quality, and the expectations of those attending and not attending GMP;
- Mothers' judgement on GMP programmes, including positive aspects and criticisms;
- Reasons for not attending GMP (in the case of non-attending mothers).

Themes and sub-themes were imported into NUD-IST 4.0 software for analysis.

The frequency of occurrence of different criteria, expectations or criticisms as expressed by mothers was calculated. In-group discussions, a given criterion (or expectation or criticism) was only counted once even if more than one women mentioned it. Four levels of satisfaction were identified based on individual interviews with mothers: unsatisfied, little satisfied, satisfied and very much satisfied, with corresponding scores ranging from 1 to 4. Mean overall satisfaction level was calculated in each programme, and satisfaction with each dimension of GMP was correlated with other dimensions, and with overall satisfaction. For normative assessment, quantifiable data were analyzed with SPSS 9.0. Quality scores were calculated for every dimension of GMP, and their association analyzed using Spearman correlation. The internal consistency of scores was tested with Cronbach Alpha.

Results

GMP is an activity of the health sector, and it is carried out by health professionals (midwives, nurses, social workers) or community health workers. GMP is sometimes coupled with immunization and with group talks for health and nutrition education. In all the sites, curative care is available, generic drugs are sold at low price, and nutrition rehabilitation is provided for malnourished children.

Around 50 mothers were involved in group or individual interviews in each site. Women appeared more reluctant to talk in individual interviews than in focus groups, especially in the rural site. A few questions remained unanswered, particularly those pertaining to behaviour of GMP personnel. Non-attending mothers appeared very vocal in their criticisms of the programmes. Most of attending mothers had a child aged under one year.

Criteria used by mothers to assess quality of GMP programmes

General and specific expectations of mothers regarding GMP are considered to define their criteria of quality and satisfaction.

General expectations and expected benefits

Mothers value the importance of GMP. What they seek in the intervention is to be reassured on their child's growth, and to learn how to feed and care for the child for optimal health. This is what motivates them to attend GMP.

Specific expectations

These refer to mothers' perceptions of how GMP should be organized and executed.

Organization

Avoiding waste of maternal time was frequently mentioned. Mothers expressed the wish for GMP to be held more frequently in order for shorter waits for attending mothers. GMP should be offered not only in mornings, but also in afternoons, as mothers feel that they would then be more available to attend. They would like that all mothers that show up for GMP be accepted, and in order of their arrival. GMP should start on time. Two other criteria were frequently mentioned by non-attending mothers: a maximum fee and a walking distance.

Technical procedures

The need for individual advice or group education in order for mothers to better feed and care for their children is mentioned in nearly all interviews and discussions. They expect to be informed of the weight and health status of their child at each weighing. In the case of inadequate weight gain, they want the worker doing the GMP to look for the cause of the problem and to inform them on what they can do to solve the problem.

"If they weigh my child and find that his weight is good, they should let me know. If I weigh the child myself, I will not know what is OK and what is not. So they should tell me what I have to do so the child gains weight and is doing well."

Mothers also expect that if the child is sick when coming to be weighed, he will receive proper treatment. They state that immunization status should be verified. Mothers would like to be complimented on their child if he is doing well. They want food demonstrations, and they also want to be asked how they feed their child in order for any mistake to be corrected. Some mothers 264 expressed the wish to learn from the feeding and care practices of mothers whose children are thriving. Some also insisted that the GMP practitioners should make sure that they understand and can put into practice the advice given to them.

Interpersonal relationships

Nearly all respondents emphasized the need to be well received, and to be respected. Mothers also wish to be able to speak to the GMP officer without fear, and in return, they want the officer to answer in a gentle manner, and to be willing to help.

"I want them to be our friends, so that we can talk freely with them. Child weighing has to be a way for the GMP officer to help mothers, and mothers also have to help one another".

In the rural government programme and in the civil NGO one, mothers mentioned that they should be able to understand the language spoken by the GMP officer, and also that conflicts between mothers should be avoided.

Regarding GMP-related services, supplying essential drugs at low cost (done in all programmes), selling complementary feeds at low cost, and immunizations are highly valued by mothers, who recognize that the immunized child is protected against major killer diseases. "Add-ons" that mothers view as incentives to participate in GMP are some form of rewards for regular attendants with children who are doing well, as well as material assistance for the very poor.

In all focus groups with mothers attending GMP, involving community leaders was seen as important, as it would result in social mobilization for GMP, and mothers would more easily gain approval and support on the part of their family. The proper age range for GMP was up to 2 years in 66% of group discussions.

Mothers' and experts' GMP quality criteria

Table I lists the criteria of GMP quality under three categories: those that mothers mentioned and that we used in our good practice-based evaluation of programmes; those that were identified only by mothers; and those that were only considered by us, and not by mothers. It is seen that maternal and "expert" criteria show a great deal of consistency. Those that are omitted by mothers are primarily technical in nature. Sharing of knowledge and best practices among mothers, and using their own language were only mentioned by mothers; these criteria were not included in our checklist, in spite of their relevance. As for complementary services or activities, others referred to material assistance, although immunization was also mentioned.

	Expert's criteria also identified by mothers	Expert's criteria not mentioned by mothers	Mothers' criteria not included in expert's list
Orga-	Waiting time	Results transfer to higher	All mothers who show
niza-	Attendance fees	levels	up for GPM are accepted
Tech- nical	Opening hours Access to GMP site Number of sessions per week Frequency of child weighing per month Precincts and scales cleanliness Scale condition Number of seats Do history of feeding practices	Personnel (numbers and qualification) Supply of growth charts Check scale Copy children's weight in	GMP starts on time Examine child doing well once in a while
proce-	Encourage and	the general registry of	Share knowledge and
dures	congratulate mothers if child doing well Give nutrition advice to mothers Remind immunization date Seek causes/solutions in growth faltering Check mother's understanding Make sure mother can follow advice Motivate mother to come back Treat sick children Do food demonstrations	centre Draw the growth curve, interpret it and explain it to mother Closely follow-up children with growth faltering	best practices among mothers Look for simpler and cheaper alternatives solutions
	Related activities Immunizations	Related activities Family planning advices	Related activities Rewards for mothers whose children thrive Material assistance of poor mothers Drugs and complementary food at low cost
Inter-	Mothers want to:	Officer's motivation and	Mothers want:
per-	Be respected	Contact time between	the GMP officer without
rele-	Have GMP officer's	officer and mother	fear
tion-	nersonal attention		To get help from GMP
shine	personal attention		officers
ampa			To understand the
			language spoken by the
			GMP officer
			Avoidance of conflicts
			between mothers
1			

Table 1: Consistency between expert's and mothers' quality criteria

266

Mothers' judgement on GMP vs. normative quality

Figure 2 gives the total number of positive and negative statements made by mothers on each programme. It is seen that government's programmes are more criticized than the others.



However, all four programmes were similarly evaluated as regards organization, and similar shortcomings were identified by mothers, as well as through our evaluation. Opening hours are inadequate and fees are usually considered too high. Mothers complained about waiting time and being turned down in certain instances owing to overcrowding. Criticisms predominate on technical procedures only in the case of government programmes. Mothers complain about the lack of advice given to them, the absence of investigation of the causes of growth failure, and the fact that immunization status is not checked. We found the same through observation. In non-governmental programmes, there are few complaints. Nutritional advice is usually given in the course of group education, including the promotion of breast-feeding. Mothers value the advice, although it is not always scientifically sound (which they cannot judge) as mentioned in normative evaluation, nor practicable (which they forcibly recognize). For instance, recommending orange juice for two week-old infants is not justified. In the non-governmental programmes, mothers are asked

about the health of the child. However, it is only in the Mission that a systematic history of the child's diet is taken and mothers informed of the weight of their child.

Mothers are generally unaware of the growth chart. Malnourished children screened in the GMP programme are referred to the hospital if severe infection is present, otherwise nutritional rehabilitation is done on a day-care basis over two or 3 weeks according to WHO protocol (11). Regarding human relationships, mothers, particularly younger ones, complain about poor reception, lack of consideration and of personalized attention, particularly in government programmes and in the civil NGO. In all four programmes, mothers complain about being sometimes turned down even before closing time, and about their time being wasted in long waits before being attended to. All criticisms and positive points mentioned by mothers on technical procedures and human relationships were included in the normative assessment. The scores for these two components of quality were correlated in our evaluation of programmes (r=0.92 and p<0.01), but showed no relationship with GMP officers' knowledge scores.

The results of the normative evaluation of programmes are shown in Figure 3, and maternal satisfaction scores in Figure 4. It is seen that the ranking of programmes is similar with both methods.

Figure 3: Mean scores of technical procedures, interpersonal relationships and knowledge by programmes



Programmes

268

Figure 4: Maternal satisfaction with GMP programmes in general and with specific components (from individual interviews)



Programmes

Satisfaction with government programmes appears lower. The Mission programme is the best rated. The civil NGO programme gets a lower mark than the Mission run programme. There is a close correlation among specific component satisfaction scores, and between these and overall satisfaction, as seen in Table 2. Satisfaction score with interpersonal relations is the most closely correlated with overall satisfaction (r=0.73)

Table 2: Correlation among scores of mothers' satisfaction,overall and specific (Spearman r)

	Organization	Technical Procedures	Interpersonal relationships
Overall satisfaction	0.63*	0.59*	0.73*
Technical procedures			0.78*
Organization		.55*	0.62*
*P<0.01			

As can be expected, mothers report that they are more likely to attend GMP if they are satisfied with the programme. All nonattending mothers had already attended GMP. Most often, they would stop going because they were not satisfied, meaning that their expectations were not fulfilled.

"They don't tell you that your child is not growing, that you should give him this or that to eat. I don't like that. If they told me, I would like it. But since they don't, I don't like the weighing and I feel I waste my time and my work by going there".

Other reasons for not attending are interference with income generating activities of mothers, or with domestic chores normally done in mornings, or else, disapproval by a family member.

Discussion

Our in-depth study of four GMP programmes run by different institutions in Côte d'Ivoire was intended to assess maternal satisfaction, the underlying criteria, and to compare these with our own criteria for evaluating the quality of these programmes. Many of the criteria stated by mothers have been reported in previous studies on satisfaction with primary health care and reproductive health services (12, 13). To our knowledge, our study is the first to use such an approach in the framework of evaluation of nutrition programmes (for GMP is considered a nutrition intervention programme, or better, a strategy for nutritional improvement).

It is interesting to note that mothers' overall evaluation of programmes is very close to the conclusions of our normative assessment of the same programmes, which adds to the credibility of the findings (9), and confirms the ability of mothers to judge programme quality. Programmes indeed varied in quality, but programmes government-run rated lower that NGO-run programmes. Detection and follow-up of high-risk children was inadequate in all programmes, and particularly so in government ones. A common observation or complaint was poor organization. Mothers brought out most shortcomings regarding interpersonal relations, but only some of the technical weaknesses. There are indeed limitations to end-users' evaluation, as noted by some authors (14). In our study, for instance, mothers were not in a position to fully evaluate technical procedures as they are not aware of specific requirements, and they cannot assess the scientific relevance of the advice given to them. Nonetheless, the remarkable consistency of mothers' and expert's criteria of GMP programme quality is indicative of content validity (9) of our study

Mothers perhaps even more than GMP officers recognize the importance of prevention in GMP since they include many such items as criteria of their satisfaction. They wish to be given support, advice and information in order to better feed and care for their child, thereby preventing growth failure and disease. Identified shortcomings in technical procedures and interpersonal relations betray inadequacies of personnel in nutrition, in persuasive communication, and in caring; these shortcomings could be overcome by training focusing on skill development. The poorer quality of government programmes could be ascribed, at least partly, to shortage of material. Lack of personnel interest and motivation in the activities may also be involved, in addition to lack of supervision.

Mothers express a rather high level of overall satisfaction with the GMP programmes, in spite of numerous criticisms. It is a common observation that few beneficiaries would express general dissatisfaction with health programmes (15). In studies in Tanzania, the great majority of health care beneficiaries declared themselves satisfied, irrespective of the number of complaints or criticisms (12,16). The apparent discrepancy may be associated with methodological weaknesses, specific patients, characteristics, or else, the fear of reprisal. Fear may have been present in our study, and could explain the reluctance of mothers to express their own judgement on programmes, particularly in the rural area and during individual interviews. At least one respondent said that she feared that what she said would be repeated to the officers. Notwithstanding, the higher level of mothers' satisfaction and a greater number of positive statements in the better quality GMP programmes provide external validity to our findings, which could therefore also apply to other similar population groups (9).

The strong positive correlation observed between technical procedures and interpersonal relationships in the normative assessment, as well as among mothers' satisfaction scores on GMP suggest that these aspects are closely interrelated. Maternal satisfaction with interpersonal relationships was even more closely correlated with overall satisfaction, which confirms our hypothesis.

Mothers are interested in GMP and recognize its importance, but they may stop attending if the programme is not in accordance with their expectations. Factors unrelated to quality of services were found to hinder GMP attendance, as also observed in other studies. In a study on GMP in Zaire (17), the end of immunization contacts with the health system, a child apparently in good health and maternal workload were common reasons for interrupting. In studies in Tanzania, lack of consideration or harshness of health workers were reported to discourage use of health services. Community involvement in the GMP programme, assistance for the very poor, and rewards for regular attendance were among the incentives wanted by mothers. Interestingly, community mobilization was a key ingredient of success of the communitybased GMP programme in Iringa, Tanzania *(18)*. This strongly suggests that mothers' wants and suggestions need to be taken seriously.

Conclusion

Our results show that mothers are capable of assessing the quality of services. Interestingly, mothers' perception of GMP is congruent with the triple-A approach of UNICEF - Assessment, Analysis, and Action. However, programmes do not emphasize this preventive approach. More adequate training of personnel, and community involvement so that mothers' expectations are better fulfilled, may bring about improvements in GMP programmes. Quality control is also needed for programmes to meet minimum standards as regards, for instance, the relevance of nutritional advice. For supervision, a checklist of criteria such as developed in our study could be used, after adding the relevant criteria supplied by mothers, particularly the sharing among mothers of positive experiences with child feeding practices. Unknowingly, these mothers advocate the positive deviance' approach (19). Mothers' satisfaction could be checked periodically in-group discussions so that programmes evolve in the right direction.

Acknowledgements

The authors wish to thank UNICEF Côte d'Ivoire for funding field data collection. They acknowledge support provided by Dr Jeanne Diarra-Nama, Director, National Institute of Public Health of Côte d'Ivoire. They are also most grateful to mothers and workers for their participation in the study.

References

- 1. UNICEF. Stratégie visant à améliorer la nutrition des enfants et des femmes dans les pays en développement. *New York: UNICEF*, 1990.
- 2. Gerein NM, Ross DA. Is growth monitiring worthwhile? An evaluation of its use in three child health programmes in Zaïre. *Soc Sci Med.* 1991;**32**:667-75.
- 3. Morley D. Growth monitoring a forgotten subject. *Food Nutr Agr.* 2000;**27**:14-19.
- 4. Pelletier DL. The uses and limitations of information in the Iringa Nutrition programme, Tanzania. *New York: CFNPP Publication*, 1991.

- Shekar M, Latham MC. Growth monitoring can and does work! An example from the Tamil Nadu integrated nutrition project in rural south India. Ind J Pediatr. 1992;59:5-15.
- Valadez JJ, Brown LD, Vargas WW, Moley D. Using lot quality assurance sampling to assess measurment for growth monitoring in a developing country's primary health care system. *Int J Epidemiol.* 1996;25:381-7.
- 7. Griffiths M, Dickin K, Favin M. Promoting the growth of children: What works. Rationale and guidance for programmes. *Washington: The World Bank Human Development Department*, 1996.
- Coulibaly F, Delisle H, Keita A, Haddad S. Évaluation normative de la qualité d'une intervention importante de nutrition, le suivi de la croissance des nourrissons: étude exploratoire en Côte d'Ivoire. Méd Nutr. 2001;37:137-148.
- 9. Yin RK. Case study research. Design and methods. 2nd ed. California: Sage Publications, Inc, 1994.
- 10. Van der Maren JM. Méthodes de recherche pour l'éducation. Montréal: Les Presses de l'Université de Montréal, 1996.
- 11. OMS. La prise en charge de la malnutrition sévère: Manuel à l'usage des médecins et autres personnels de santé à des postes d'encadrement. *Genève*, 2000.
- Gilson L, Alilio M. Heggenhougen K. Comunity satisfaction with primary health care services : An evaluation undertaken in the Morogoro region of Tanzania. Soc Sci Med. 1994;39:767-80.
- 13. Drain M. Quality improvement in primary care and the importance of patient perceptions. *J Ambulatory Care Manage*. 2001;**24**:30-46.
- 14. Williams B. Patients satisfaction : A valid concept?. Soc Sci Med. 1994;**38**:509-16.
- Bernhart MH. Wiadnyana IGP, Wihardjo H, Pohan I. Patient satisfaction in developing countries. Soc Sci Med. 1999;48:989-96.
- Masatu MC, Knut-Inge k, Kvale G. Use of health services and reported satisfaction among primary chool adolescents in Arusha, Tanzania. J. Adolescent Health. 2001;28:278-87.
- Mapatano MA, Lusamba D, Banéa M. Evaluation of growth monitoring programme in children in Kinshasa. East Afr Med J. 1997;74:96-9.
- Pelletier DL, Jonsson U. The use of information in the Iringa nutrition programme. Food Policy. 1994;19:301-12.
- Zeitlin, M, Ghassemi H, Mansour M. Positive deviance in child nutrition. United Nations University, 1990.

PROMOTING GROWTH AND DEVELOPMENT OF UNDER-FIVES SEECALINE – WORLD PROGRAMME IN MADAGASCAR

Michelle Ratsivalaka¹

Introduction

In Madagascar in 1992, nutrition action made a turn around from a limited number of isolated relatively ineffective nutrition interventions. Further the Malagasy Government requested the World Bank to support its poverty reduction objective by fighting malnutrition.

The Government and the World Bank reached agreement on a Food Security and Nutrition project (SECALINE 1) with a strong orientation on community involvement. SECALINE 1 was an independently managed project reporting to the Prime Minister's office, and made a contribution to the reduction of child malnutrition through the development of community based nutrition interventions in two of the most food insecure provinces of the country (Toliara and Antananarivo). Moderate malnutrition among children under five was reduced; however, the actions were too limited in their scope and coverage to impact on the nutrition situation of the country as a whole. Following SECALINE 1, SEECALINE 2 is based on lessons learned from SECALINE 1 and from local and international experience. The project aims at reducing child malnutrition nation wide and achieving sustainable nutrition outcomes by improving the quality and quantity of food intake by children and pregnant and lactating women.

The two projects, SECALINE 1 (1993-1998) and SEECALINE 2 (1998-2003) are funded by:

- World Bank (IDA): 49 million US Dollars
- World Food Programme(grant): 24 million US Dollars
- Malagasy Government: 3.1 million US\$
- Japanese Government (ppf): 1.1 million US\$
- Beneficiaries: 1.8 million US\$

Country Profile

With a land surface of 587.040 square kilometers, Madagascar is the world's fourth largest island. A narrow coastal

274

¹ World Bank, Madagascar

plain of 5.000 km, and a high plateau and mountains in the centre characterize the country, which is comparable in size to France, and the Netherlands combined. The climate is extremely diverse with tropical zones along the coast and in the north, temperate climate in the elevated areas upcountry, and arid areas in the South. The island is subject to natural disasters such as cyclones, droughts, and locust invasions in the South.

Administratively, Madagascar is divided into six provinces or "faritany", districts and villages.

Madagascar has an estimated population of almost 16 million people. The population is growing at an estimated rate of 2.8 percent per year. More than half of the population is below 19 years of age and the total fertility rate is around 5.7 children per woman. About three-quarters of the total population live in rural areas (Table 1).

Indicator	Outcome
Total population	15,0 million
Total fertility rate	6,0
Population growth rate	2,9 %
Proportion under 5 years	18 %
Proportion under 15 years	45 %
Proportion urban	28 %
GNP per capita (2000)	260 US\$
GDP growth (2000)	4,8 %
Wood/charcoal of total energy consumption	80 %
Access to safe water	
Rural	4 %
Urban	54 %
Literacy rate (population 15 +)	46 %
Life expectancy	58 years
Women giving birth before age 20	57 %
Under 5 mortality rate	157/1,000
Infant mortality rate	95/1,000
Stunting 0 – 36 months	48 %
Wasting 0 – 36 months	7 %
Underweight $0 - 36$ months	40 %

Table 1: Basic social demographic and health related indicators

Nutritional Status

Madagascar has one of the highest rates of chronic and severe malnutrition in Africa. At 48 percent, the proportion of stunted children below three years of age in Madagascar is the highest among the Sub-Saharan countries. Seven percent are wasted and 40 percent underweight. This implies that chronic malnutrition for children under three is 21 times higher than the international standard.

In addition to the anthropometric indicators of malnutrition, national surveys also show that iron deficiency, leading to anaemia, is widespread among children. The prevalence of anaemia for women (15-49 years) is 42 percent, children under three 67 percent and school-age children (6–14 years) 38,5 percent. The prevalence of vitamin A deficiency is estimated at around 41,8 %.

Finally, Iodine Deficiency Disorders (IDD) have been virtually eliminated since the launching of the National IDD control programme in 1992.

Poverty, lack of education, and poor feeding, health, and caring practices are the main causes of malnutrition in Madagascar. Malagasy's actions to fight against malnutrition are:

 \Rightarrow Integrated Management of childhood illnesses (IMCI)

- Vaccination;
- Growth monitoring;
- Vitamin A supplementation;
- Iron-folate supplementation;
- De-worming;
- Salt iodination;
- Prenatal and postnatal check-ups.

Nutrition action

SECALINE 1

The Food Security and Nutrition Project was the first in Madagascar of its scope and size to work with communities and NGO's. The project focused on two provinces, suffering from extreme food scarcities, Antananarivo and Toliara. The components were:

- Income generating activities through a Social Development Fund and Food-for-Work;
- Direct nutrition activities;
- Institutional Strengthening through IEC and development of a National Food Security Strategy.

The Nutrition component included:

- Financial support for the national IDD control programme and iodized salt campaign ;
- Community based nutrition with growth monitoring, nutrition education and supplementary feeding ;
- Information, Education and Communication support and the elaboration of a National Food Security Strategy.

Results

One of the most remarkable results of this project, which closed in 1998, was the set-up of 535 community nutrition sites in two of the six regions where the growth of half a million children under five was monitored. There was a highly significant impact on children. In the targeted communities with nutrition sites, the rate of malnutrition among these children decreased by about 58 % in Antananarivo and 48 % in Toliara.

Thanks to the nation-wide iodized salt campaign, the goitre prevalence in pregnant women and school children decreased from 45% in 1992 to 15% in 1998.

The Social Development Fund paid for 2,8 million person-days of temporary work. The rural roads, bridges and other structures built mean that people now have better access to social services and markets. While the first Secaline project was highly successful only the iodized salt campaign had national impact. If anything, due to economic stagnation, hunger or malnutrition rates in Madagascar was worse in 1997 than in 1993. Expansion of the programme was sorely needed.

SEECALINE 2

The second Community Nutrition project "SEECALINE 2" covers the entire country, targeting almost a million children under three years of age, 2,5 million children up to 14 years, and more than 700,000 pregnant or lactating women. This coverage is reached by setting up 4.600 community nutrition sites in the most affected regions, where malnutrition rate is over 43 % according to the anthropometric survey in 1998. In addition, SEECALINE includes a nation-wide primary school nutrition component that includes de-worming (also for pre-schoolers), iron/folate supplements, promotion of hygiene among children and their teachers, in more than 6 500 primary schools.

Goals

- Reduce underweight and vitamin A deficiency in children under three by 30 %;
- reduce iron deficiency anaemia among primary school children by 25 %;
- Reduce helminthes infections (parasites) among 3 –14 years old by 25 %;
- Improve community awareness and capacity to take action.
Methods

SEECALINE 2 is built on our prior experiences of the following interventions in SECALINE 1:

- Promotion of changing inadequate nutritional behaviour;
- Growth monitoring and promotion;
- On-site food supplementation of malnourished children and nutrition education;
- Support to the salt iodination campaign to reduce goitre;
- Focus on the community to improve nutrition and hygiene;
- Partnership between NGO's and the regional sub-units to jointly select and invite communities to participate.

In SEECALINE 2 we expanded our efforts in the struggle against malnutrition by:

- Distribution of food supplements to take home,
- Food supplementation for all pregnant women in the last trimester,
- Vitamin A supplementation for children and mothers after delivery
- A school nutrition and health programme
- Implementation by several ministries of the aspects of the programme pertinent to their sectors. For example SEECALINE provides iron tablets to the Ministry of Education for primary school children, anti-helminthes to pre-schoolers as well as primary school children. SEECALINE supports the Ministry of Health by providing training in Integrated Management of Childhood Illnesses to medical personnel, and non-medical equipment to hospitals that have special units for severely malnourished children.

Whereas SECALINE 1 addressed children under five years of age, SEECALINE 2 is now targeting children under three, but also pregnant and lactating women, pre-schoolers (3 - 5 years) and primary school children. World Bank (1997) sees nutrition as a major determinant of human capital, and tailored actions by the community may correct growth faltering only if we intervene before the age of three years.

SEECALINE is halfway the second project. Until now, 1.947 community nutrition sites are operational in 49 districts of six provinces; 343.988 children under three participate in the growth-monitoring programme.

196.691 children from 6 months to three years old and 36.621 lactating mothers of new-born children have been supplemented with vitamin A, 176.760 malnourished children and 23.132 pregnant women were supplemented with Corn Soy Blend, a donation of the World Food Programme.

430.687 primary school children and 249.496 pre-schoolers are de-wormed and 424.385 primary school going children were supplemented with iron-folate.

The anthropometric studies showed a 15 percent decrease in the rate of malnutrition. It is too early to assess impact of the project, but monitoring and promoting growth is a central point to SEECALINE 2, as it is to many nutrition programmes around the world, as a tool to change inadequate habits in child health care and feeding in the fight against malnutrition.

In fact, the community perception still exists that inadequate food availability and production alone cause malnutrition and that increasing food production will solve the problem. Hence, agricultural development is generally seen as the only sustainable response to malnutrition, facing this problem, SEECALINE promotes behavioural change through the implementation of their IEC strategy as another sustainable solution in order to reach adequate infant feeding and breast feeding practices, and micronutrient supplementation. For SEECALINE, growth monitoring is an entry point to the sensitization to change inadequate habits. All children under three are weighed monthly by the NCA with the assistance of mothers. The NCA counsels the mother on the nutritional status of her child, as indicated by the growth chart, and advises her according to the child needs. Through this activity, SEECALINE convinces mothers and the community to adopt its programme philosophy. Multiple IEC techniques and supports are used:

- Register, and reporting of individual data on a graph for the whole population;
- Home visits to children that show no progress in growth;
- Every trimester, NCA and the social worker discuss and sensitize the community the nutrition situation in the village, based on the evolution of the nutritional status of children, and the likely determinants of malnutrition in their community.

They help the community to identify solutions and design doable and sustainable activities and pass on other nutrition messages.

Even the very poor can improve their nutrition; the secret lies in proper breast-feeding weaning and knowing which local, low cost foods are nutritious. Thus interpersonal communication and counselling are vital. SEECALINE's mothers accept to bring their infant monthly to the community sites to weight, because they are convinced that the child's growth chart shows his health and they know what it means: a green child – yellow child – or red child on a growth chart.

Promoting growth at SEECALINE's community sites is very successful because over 70 percent of the targeted children under three are participating in growth monitoring. Moreover, weighing sessions are followed by group sessions of nutrition education and cooking demonstrations on top of the individual talks with the mother.

In Madagascar multiple partners in nutrition collaborate to harmonize messages, that can easily be understood by illiterate mothers. Which message is most effective in addressing essential behaviour? How do we get the messages across? SEECALINE's key to these questions is to identify simple, do-able actions, which will make the biggest difference.

The messages cover infant growth monitoring and promotion, mother care, breast feeding, complementary feeding, micronutrients and food hygiene. All the messages have been validated and fieldtested.

Some messages:

- Mothers, your child's weight shows his growth and his health;
- Breast feed exclusively for six months, after six months, gradually add simple, nutritious foods;
- Families, wash your hands before eating to avoid transmitting germs, and thus prevent sickness.

Finally, many baby girls are now named SECALINE, this recognition can be attributed to the success of the programme.

Conclusive remarks

- Growth monitoring and promotion is not an activity that stand on its own
- It is a tool , an entry point to successful behavioural change communication
- It can and should be used to transmit health and nutrition messages to the entire community as well as to the individual parents

Acronyms

DHS	: Demographic and Health Survey
GDP	: Gross Domestic Product
GNP	: Gross National Product
IDD	: Iodine Deficiency Disorders
IEC	: Information - Education - Communication
IMCI	: Integrated Management of Childhood illnesses
MOA	: Ministry of Agriculture
MOH	: Ministry of Health
NCA	: Nutrition Community Agent
NGO	: Non Governmental Organism
PPF	: Project preparation fund
SECALINE I	: Food Security and Nutrition
SEECALINE II	: School, Community, Surveillance and Education in Nutrition
WFP	: World food programme

ASSISTING MOTHERS AND CARETAKERS TO ADOPT BEHAVIOURS THAT PROMOTE CHILD GROWTH AND DEVELOPMENT: THE HEARTH PROGRAMME IN HAITI, VIETNAM AND ELSEWHERE

Gretchen Berggren¹, Monique Sternin², Jerry Sternin², Warren Berggren³, Eddy Genece⁴, Antoine Augustin⁵, Herve Bottex⁶

Introduction

Transferring Skills from the Successful ("Positive Deviant") Caretaker to the Family of the Malnourished Child

In most villages or poverty-stricken neighbourhoods in third world countries there are some poor families whose children, against all odds, remain relatively well nourished. Their mothers or caretakers, known as "positive deviants", hold the key to behaviours that could be life-saving to other members of the community if those skills could be transferred (1). The HEARTH method accomplishes this transfer through a series of village level skillbuilding workshops that take place in the "hearth" (kitchen) of a motivated and trained volunteer mother from the same community who uses local foods to begin the rehabilitation process for her neighbour's malnourished children. The change in the child after two weeks of receiving an extra meal and snack is, in many children, so obvious that the whole community begins to take notice. The menu, ferreted out through local participation in the "positive deviant inquiry" (PDI) reflects the best of their own traditions as well as sound dietary principles. In the fifteen countries where the HEARTH/Positive Deviance method has been applied, prerequisites usually include an ongoing community based primary health care programme, growth monitoring/counselling (GMC) capability, trained and supervised local nutrition trainers,

¹ International Health Consultant (Dallas TX), Lecturer Harvard University School of Public Health (retired)

² Tufts University School of Nutrition, Medford, MA, USA

³ International Health Consultant (Dallas TX), formerly assist. Prof. of Tropical Public Health, Harvard University School of Public Health

⁴ "Promoteurs Objectif ZERO AIDS (POZSIDA)", Port au Prince, Haiti

⁵ CITYMED and MARCH projects; Ministry of Health and Population, Port au Prince, Haiti

⁶ AIDS Family Services, Voluteers of America, Yonkers, NY, USA

and volunteer mothers as well as community preparation and commitment (2).

The Hearth/positive deviance method must be adapted to each culture where it is applied. Sternin and Choo (3), describing the method in Vietnam, write, "By examining the behaviour of the positive deviants in the community, we hoped to find local strategies for combating malnutrition. And that's exactly what we did find. It turns out that the mothers in those families were going out every day to nearby rice paddies and collecting tiny shrimps and crabs, which they were adding, along with sweet potato greens, to their children's meals. They were also feeding their children three to four times a day, rather than the customary twice a day. The shellfish and greens were both readily available and free for the taking, but conventional village wisdom held these foods to be inappropriate for young children. It was clear, therefore, that the immediate solution to the malnutrition problem did not require...money or outside resources; it simply required the community members to change their behaviour and to start emulating the positive deviants in their midst".

Justification

To encourage child growth and development, programmes in the third world often develop community based strategies to reach every child with immunization, distribution of micro-nutrients, regular deworming, and growth monitoring/counselling (GMC), as well as early detection and referral for infectious disease. However, a sustainable and culturally appropriate nutrition intervention, is often lacking. Such an intervention should leave families with the capacity to intervene when a child begins to become malnourished, that is, when he or she falls behind in growth and/or is in danger of doing so. In order for the child to fully recover, "catch-up growth" is necessary; that is, the child needs to begin to grow again at a rate as fast or faster than the international standard median. The child may need to have an infection treated, but the mother or caretaker needs skills to overcome anorexia and to provide an appealing menu composed of inexpensive, calorie-dense local foods. A change in child-feeding behaviours is often needed. The HEARTH exercise in her own neighbourhood offers a mother or caretaker the chance to practice child-feeding and hygienic skills in a supportive atmosphere, surrounded by peers, under the direction of a trained volunteer mother. The alternative to simply "counsel" such mothers rarely results in behavioural change. Mothers may repeat a "message" and even understand it, but the question is whether they can apply it. Provision of a skill-building practicum that allows caretakers to participate in very low-cost food preparation and feeding of malnourished children daily over a two to four week period is more apt to result in behavioural change.

The HEARTH model, if properly applied, allows enough time to develop new habits. At the same time, parental observation of the change in the child, if it can be attributed to improved feeding practices, is a powerful demonstration that "refeeding" the child really works. And because it involves training of volunteer mothers by locally recruited and trained nutrition-aids (a "training of trainers" approach) there is "fall-out" to the whole community. Fathers especially become excited by the idea that malnutrition can be prevented. It is expected that:

- A major output will be a cadre of volunteer mothers who can recognize malnutrition and begin the rehabilitation process in their own homes, using local foods, based on the PDI (above);
- Malnutrition will be prevented in the future by caretakers trained during the rehabilitative process;
- The whole community will be "turned on" to combat malnutrition (3).

Methodology:

How and why the HEARTH/Positive Deviance Method works

The goal of the HEARTH programme is to reduce or eliminate malnutrition in a sustainable way through a "skill transfer" of caring and child-feeding behaviours using a menu built on a local "positive deviance inquiry" (PDI) in the same village. Ideally, poverty alleviation is also associated with the programme, but in any case, the HEARTH approach allows mothers to practice and master skills that leave them better able to combat malnutrition. Related caring and enabling behaviours, such as good hygiene and child spacing methods are demonstrated or discussed during daily sessions for two weeks. The participating mother or caretaker is expected to contribute her share of the menu daily, to accompany her child, and to agree to continue the extra daily meal and snack for two weeks in her own home under the watchful eye of the volunteer.

HEARTHs are small, temporary village-level workshops for mothers or caretakers to practice nutrition and caring behaviours by beginning to rehabilitate their own children in the home-kitchen (HEARTH) of a neighbourhood volunteer, using local foods. The daily menu, based on a PDI previously accomplished by the villagers themselves, is practical and low cost. Since the HEARTH works neighbourhood by neighbourhood, there will be only 4 - 6mothers and children in each HEARTH, and several will be going on at once. One HEARTH supervisor-trainer will look in on each of several HEARTHs in a given village daily for two weeks. Other HEARTH trainer-supervisors will be working in villages nearby at the same time, depending on how many HEARTH supervisortrainers the programme can employ.

Overall, the HEARTH supervisor-trainer, under the supervision of her superior, will be supervising the rehabilitation of 20 – 30 children per month. More than this number of children may be reached as mothers are permitted to bring younger siblings to the HEARTH, and the volunteer mother herself may have a child (malnourished or not) that will participate. (N.B.: One cannot expect the volunteer mother to deny her own child the "extra meal and snack" that the HEARTH offers!) The HEARTH supervisor-trainer, previously trained by the staff of the programme, must be present in the village while HEARTHs are going on, visiting each HEARTH to trouble-shoot any problems, to be sure the menu is adequate, and to complete forms for the information system. She will have preciously trained the volunteer mothers (five days training for a few hours each day).

Steps to HEARTH Implementation

Preliminary preparation

The local staff must have one professional who devotes a good part of his or her time to the project over one or more years. Several young women, locally recruited and willing to live in and/or work in outlying villages must be trained in communication skills, nutrition, anthropometry, principles simple of nutrition rehabilitation, and use of the local food-value table to calculate at least protein and calorie content of a given menu (involves weighing food portions from the local market and calculating their food value). They must carry out their own PDI after having weighed all the children in a pilot village and visited their homes to find the true "positive deviants". They must carry out a PDI to the satisfaction of their teachers, and understand the local child survival programme components (such as immunization, family planning, and protocol for de-worming). These young women, at least those proving themselves capable, will become the supervisor-trainers for the HEARTH programme. In Vietnam, such women were already part of the infrastructure, and were willing to play this role. Ability to communicate and have patience with mothers as they learn new skills is important. A practicum in a nearby hospital for training in breast-feeding and nutrition rehabilitation may be added.

Community preparation

The most crucial step for HEARTH implementation: Many visits to the community are required to assure that the whole village understands the problem of malnutrition and that something can be done. Community members, especially fathers, are invited to participate. The community is expected to furnish temporary housing for the supervisor trainer, and to support the volunteer mothers by helping with water and fuel, provision of temporary shade (a "tonnelle" in Haiti) and a nearby latrine.

Identification and recruitment of volunteer mothers distributed across the community. One volunteer mother for each 20-30 families, geographically distributed across the community is necessary. They may be illiterate, but must be willing later to devote a few hours each day for five days prior to HEARTH implementation in any given village, to learn to do a PDI and debrief with their supervisor-trainer, help create a menu based on the PDI, carry out a simple market survey to determine the lowest possible cost for a balanced menu, and demonstrate their capability to communicate with mothers and to cook a tasty meal using local foods.

Community participatory diagnosis of malnutrition

After having weighed all the children (usually under-threes) to detect those that are well nourished as well as those in need of rehabilitation, community members may help interpret their findings by construction a "pie diagram" to demonstrate the proportion of children, who are "normal", the proportion severely malnourished (weighing who less than 3 std deviations below the international std median; or WAZ - 3), and the proportion moderately malnourished (weighing -2 to -3 std deviations below the international std median or WAZ -2 to -3). During a village "weigh-in", the community health team identifies some underthrees, already weaned from the breast, who are members of poor families, and who are growing normally. Their families will be the focus of the PDI, carried out by local volunteers under supervision of the supervisor-trainer. The latter is a young woman with eighth grade education and a few weeks of extra training in nutrition. The "investigators" are volunteer mothers who will have training sessions in how to conduct the daily HEARTH exercise that includes good hygienic practices as well as preparation of the "positive deviant" foods and snacks.

Positive Deviant Inquiry

The PDI is accomplished through **home visits** to several (at least six) local poor families whose children (after complete weaning

from the breast) remain well nourished. It must precede every HEARTH in every village in order that volunteer mothers "discover" what skills they are expected to model (3). During the home visits to poor families a few local volunteer women and some staff members go together to the homes of several well nourished children to look for the key behaviours that are being applied in that home. This makes the HEARTH exercise culturally appropriate and means that there will be different findings in different cultures, and that HEARTH must be modified from place to place.

The PDI takes several hours and may require more than one visit. It includes a greatly simplified 24 hour diet recall for the well nourished pre-schooler that will pinpoint quality (what was fed) as well as the number of meals and snacks offered per day. Volunteer mothers can observe and memorize these findings and later debrief with their supervisor-trainer who records and synthesizes the results from a number of PDI's; she helps the local interviewers to discover the consistent foods that are in use, at this season in this village. For example, in Than Hoa province of Vietnam, the finding was that families with well-nourished children consistently included shrimp, free for the taking from nearby canals, as well as sweet potato greens in their diets. Interviewers also look for the "three goods":

- Good health seeking behaviours;
- Good caring behaviours;
- Good child feeding practices (3).

Hearth implementation (4,5)

HEARTHS rotate from neighbourhood to neighbourhood across a given geographic zone under the direction of trainersupervisors ("monitrices") who in turn are supervised by the professional manager-trainer, usually a doctor, a nurse, or a highly trained development worker. If one visits a village where HEARTHs are active, one sees that at a given convenient time of day, mothers or caretakers of malnourished children are making their way along with a child to a neighbour's home to participate in preparation of an "extra meal" preceded by a snack and followed by group discussion of the menu for the day, and what will be expected on the morrow. Often the discussion includes related subjects such as child spacing.

Neighbourhoods are identified within a village, and all underthrees (or under-fives) are registered. The HEARTH nutrition-aid acts as a trainer-supervisor and must visit daily to encourage and help volunteer mothers in each neighbourhood, each of whom has been trained in the previous week. Mothers of malnourished children (participant mothers) have met together in preliminary sessions in order to understand their contribution. They bring at least some of the foods to be used. The programme must provide some logistical support, including the training of each group of volunteer mothers before the HEARTH exercise begins (6,5).

After working with villagers to be sure they understand and want the programme, a trained supervisor-trainer (nutrition aid) will have trained volunteer mothers (not necessarily the "positive deviants") who are willing to offer their homes for two weeks to begin the rehabilitation process for children in their own neighbourhoods. These volunteers carry out and learn from the "positive deviants" they visit to congratulate them and to observe their caring behaviours, including their good child-feeding practices (the PDI). There must be supervision by an overall professional manager-trainer, usually a professional nurse, doctor, or experienced development worker who is attached to the health or development project concerned. One such manager-trainer can train and supervise 12 -16 local nutrition aids ("monitrices"), each of whom must have at least an eighth grade education plus a few weeks training in health and nutrition. The overall professional manager should insist that training includes local market surveys as well as the PDI, and must understand and be able to calculate protein and calorie content of locally available foods, using the local food value table.

Are you ready for HEARTH? Preliminary requirements and preparation

The primary health care programme that undergirds HEARTH

The method requires that there be a primary health care programme and referral system, ideally, community based, that includes pre-school child immunization, community-based growth monitoring/counselling (GMC), micronutrient distribution, and deworming.

N.B.: A census-based approach followed by growth monitoring/counselling is ideal. Every child counts! Community volunteers can map and number houses and keep simple registers on mothers and children by address so that every child is reached and a record kept on pertinent data, such child's monthly, bimonthly or quarterly weight. Door-to-door contact is essential to provide a "personal prompt". Many private voluntary organizations (PVO's) train resident home-visitors to invite mothers and children to "posts de rassemblement" where immunization, Vitamin A and iron supplement distribution, and periodic deworming are carried out as well as growth monitoring/counselling.

Trained staff and designated resources

At least one person professionally trained in nutrition must devote a portion of his/her time nutrition training and programme management/supervision. Resources must be set aside to provide for identification, recruitment, and training or retraining of several local women or female community health workers as nutrition-aids (local trainer/supervisors) who can devote full time to supervision HEARTHS for a time-limited period (for example, three years to reach a population of 250,000). There must be provision for simple nutrition training; and training in how to identify, recruit and train local volunteer mothers (1:30 families).

Provision for a management information system (MIS) that will interdigitate with the local government health information system. Community health workers and/or HEARTH trainers (known as "monitrices" in Haiti) collect data necessary to calculate appropriate indicators: For each child one needs to know the nutritional status of the child at entry, at exit, and six months later in order to determine whether or not the child is recovering, that is, growing as fast or faster than the international standard median. Trainersupervisors must have:

- Consecutive dates/weights (and occasional length measurements, if possible) on children being followed. Α simple manual register of children with columns for each one's date-of-birth, sex, address, and consecutive weights on given dates will suffice. The HEARTH trainer-supervisor keeps records on each HEARTH session. In addition to recording the results of the "positive deviant inquiry" (PDI), for each HEARTH participant the "trainer", if not the volunteer mother, records: Name/address of child and of child's caretaker; Date of birth, sex, date/weight (and height if possible) at entry, followed by date/weight at two weeks, four weeks, at six months and one year later.
- Consecutive weights/dates on younger siblings of malnourished children is also important in order to see if the mother has been able to prevent malnutrition.

Tools and plan for Community preparation and diagnosis

The project must have tools and instruments in place for participatory exercises that lead to a "community diagnosis" of malnutrition. Local weight/age growth charts or home-based growth monitoring records and weighing scales will be necessary. Parents help determine exact age in months for all under-threes and then weigh or re-weigh all the children, in a neighbourhood growth monitoring session. Someone in the community will be trained to place one data-point on a collective weight/age graph for each child weighed, taking care not to embarrass any parent. Usually the national "road-to-health" growth monitoring card will have indicated some norms based on the international standard median, so that one can count the number of children that fall into the category of weighing less than two standard deviations below the international standard median. In addition, any child known to be losing weight or having growth faltering may have his or her data point circled to indicate danger of malnutrition. Adult caretakers participate in discussions to reach consensus on the importance of the problem.

Results

Results in Haiti

Historically, child mortality rates declined and admissions to the hospital for severe malnutrition declined during the period when village level rehabilitation/education centres (CERNs; see discussion section) were applied to a defined population in the Hopital Albert Schweitzer (HAS) district of the Artibonite Valley of Haiti (7). In other parts of Haiti, evaluators documented that mothers trained in CERNS had adopted better use of local foods and had better knowledge about how to combat malnutrition.

During the 1980's, the" Division d'Hygiene Familale" of the Ministry of Health and Population of Haiti, under the late Dr Ary Bordes, recognized the need for nutrition intervention at the village level, but sought a low cost alternative to the CERN. With technical assistance from the Harvard School of Public Health, the "Projet Integré de Santé et de Population" in the Grand Goave-Petit Goave-Trou Chou-chou region, re-established the use of nutrition rehabilitation centres, shortening the three month rehabilitation time to a two week demonstration of appropriate feeding behaviours and a two-week follow-up (8). This exercise was known as a village level apprenticeship in nutrition or "Ti Foyers" for rural mothers, and showed results equal to those of the CERNS Children rehabilitated in the three-month-long CERNS were no better off, in a two year follow-up, than those who had benefited from the "Ti Foyers" (9).

From 1993-1997 the HEARTH method was applied by the Hopital Albert Schweitzer (HAS) to a population of over 200,000 during an embargo THAT ADVERSELY AFFECTED CHILD HEALTH (10). In a 1999 survey carried out by the Institut Haitien de L'Enfance on the same HAS population, infant and child mortality levels in the villages served by HAS or its outlying dispensaries were

at roughly half the national average. The accomplishment was attributed to good primary health care as well as an active nutrition intervention (the HEARTH model) (11).

Initial results of the HEARTH programme after a two-year application at HAS showed that, without a poverty-alleviation programme, about 60% of mothers could be expected to prevent malnutrition after HEARTH training. Of the 40% of children who fell back into malnutrition, half had chronic illness such as tuberculosis, and half came from extremely poor homes, in need of poverty alleviation (12). A retrospective study carried out by BASICS was flawed due to the high mobility of the population. Findings were confined to children who still resided in the area, and as many as 25% had moved out after their HEARTH experience. In those remaining who could be studied, children mildly malnourished at the time of their HEARTH experience (usually younger siblings of the malnourished children) had profited most (2).

More recent results in Haiti have shown that about a third of mothers cannot respond to the HEARTH programme unless their children are first treated for chronic disease (often hidden tuberculosis), and/or unless they have access to a poverty lending programme.

Dubuisson, in the Save the Children impact area (Plateau Centrale near Maissade) Haiti, found from ongoing growth monitoring data that there had been a reduction from 3rd degree (severe) malnutrition form 26% to 3% over a three year period during HEARTH interventions (13).

Results in Vietnam

Childhood malnutrition in Vietnam remains a serious and widespread problem. Despite recent downward trends, at the time of this programme application, 45% of all children under age five years were more than two standard deviations below the reference median for weight-for-age. Reducing the prevalence of under-five malnutrition to less than 30% by the year 2000 was a key goal in the 1995 National Plan of Action. The evaluation data reported here are for programmes that were in effect before recent secular trends were recorded. They did, however, compare data from where HEARTH had been applied to data from a similar ecological zone where it had not been applied.

Severe malnutrition has nearly disappeared and moderate malnutrition has been significantly lowered in villages where the HEARTH/Positive Deviance (or Poverty Alleviation/Nutrition Programme, as it is known there) was applied in Than Hoa province by a programme funded by Save the Children, USA (SC). Thanh Hoa, a rural northern traditional Vietnamese Province with a population of 3 million, is located approximately 150 kilometres south of Hanoi. There, the method was combined with a poverty alleviation programme from the outset. Four main components were implemented in ten communes in Thanh Hoa Province, Vietnam from 1993-1995. These were:

- A community census;
- A growth monitoring and promotion programme for all children under three years of age;
- A positive deviance inquiry (PDI) to identify key growth promoting behaviours;
- A nutrition education and rehabilitation programme (NERP), that incorporated the results of the PDI, for children suffering from severe malnutrition (children whose weight/age was more than 3 standard deviations below the international standard median, express as <-3 WAZ).

A recent study was carried out in collaboration with the Ministry of Health in Vietnam and the Rollins School of Public Health of Emory University, in order to document the impact of the programme.

The evaluators write: "Evaluations of Save the Children's (SC) Poverty Alleviation and Nutrition Programme (PANP) in rural communes of Vietnam have documented significant improvements in child nutritional status at the end the programme. A central element of PANP is the use of the Positive Deviance (PD) approach to identify key growth promoting behaviours. The objective of the study was to investigate whether improvements seen during a PANP intervention (1993-1995) were sustained three and four years after SC's departure. Cross-sectional surveys were administered to 46 randomly selected households in four communes that had previously participated in PANP and 25 households in a neighbouring comparison community in 1998 and 1999. Two children per household, an older child who had participated in PANP and a younger sibling who had not, were measured (total n=142 children), and their mothers were interviewed.

Results: Older SC children tended to be better nourished than their counterparts. Their younger siblings were significantly better nourished than those in the comparison group, with adjusted mean weight-for-age Z-scores of -1.82 vs.-2.45 (p=0.007), weight-for-height Z-scores of -0.71 vs.-1.45 (p<0.001), and height-for-age Z-scores of -2.11 and -2.37 (Ns, p=0.4), respectively. SC mothers reporting feeding the younger siblings more than their counterparts did (2.9 versus 2.2 main meals per day [p<0.001] and 96.2% versus 52% offering snacks [p < 0.01]). All SC mothers reported washing

their hands "often" while only 76% of the comparison mothers did [p<0.001].

Discussion: In sum, growth-promoting behaviours identified through positive deviant studies and practiced through SC's neighbourhood-based rehabilitation sessions persisted 3-4 years after programme completion. These sustained behaviours contributed to better growth of younger siblings who were never exposed to the programme itself" (14).

Results in Other Countries

Emerging data from more than 15 other countries where the HEARTH method is applied look promising. Most are being implemented by private voluntary organizations (PVOs) such as CARE, World Vision/Canada, Africare, and Save the Children/USA. The method is increasingly recognized as worthy of wider application and of scaling up (15).

Sternin summarized incoming data from a number of countries with the following findings from Save the children and other PVO's in a workshop in Bamako, Mali, in November 2000 as follows (3):

Egypt: (Save the Children, USA in Minya impact area): Reduction in malnutrition from 46% to 13% in first six months; among control villages the rates of malnutrition had not changed (16).

Guinea: (Africare Project) Weight gain at 2 months after HEARTH entry showed that 57% of malnourished children exhibited "catch up growth", growing at a rate faster then the international standard median growth rate (weight/age. Another 26% were growing at normal rates. The remainder was being investigated for chronic illnesses such as hidden tuberculosis.

Bangladesh: (Christian Service Society project in Khulna region). Weight/age measurements on malnourished children two months after entry into HEARTHS ("Shishukabars") revealed 43 % had "catch up growth" and another 47% had normal weight gain as revealed on national home-based growth monitoring (weight/age) graph.

Mali: Six months after Hearth intervention, 85% of children showed continued improvement in nutritional status and 60% of mothers had adopted appropriate weaning techniques.

Nepal: 73% of families whose children had participated the HEARTH/Positive deviance approach continued steady improvement of their nutritional status 18 months later.

293

Discussion

Historical Background

The HEARTH model is an outgrowth of Community-based Education and Rehabilitation Nutrition Centres (CERNS) of the 1960's and 70's, as they were applied in Latin America under PAHO leadership (National Institute of Nutrition of Colombia, 1971). These community-based centres educated mothers in their own communities to rehabilitate children using local foods. Usually they reached 30-40 mothers and children at a time, and children came daily for three months or more, with mothers taking turns in a practicum to prepare meals and learn new child feeding behaviours (17,18). They were extensively documented and shown to affect child feeding behaviours and improve nutritional status in Haiti, but not shown to be cost-effective elsewhere (19). The original model was an itinerant one, designed to have temporary centres in village after village. Once the CERNS tended to become permanent within a village, reaching further and further out to find malnourished children, they were less cost-effective, partly due to absenteeism and lack of participation from mothers who came from far away.

How adults learn

Adults learn best when they are given a chance to discover for themselves, and practice new skills in an atmosphere of safety and trust, where they are encouraged by their peers. There must be much iteration before a new behaviour is internalized. Behaviouralists in the advertising industry have discovered that it takes "21 repetitions of a skill in order to form a habit" (20). HEARTH offers, for a few hours each day for two weeks, a practicum in how and what to feed a malnourished child, followed by two weeks of follow-up. The person in charge of the practicum, a nearby volunteer mother, continues to look in on the mother or caretaker of the malnourished child for two more weeks as she practices in her own home. The demonstration that most affects villagers is the change in the child as he or she becomes hungry, playful, and active during recuperation. During group discussion and feedback sessions, the change can be attributed to food and not to medicine, as would happen in a hospital recuperation centre (21, 22).

294

Pitfalls

Personnel training, supervision and adherence to norms

HEARTH programmes fail without adequate training and supervision. There is also a tendency to take short cuts, such as leaving out the participatory PDI.

Volunteer mothers are the key to HEARTH programmes, and they must in turn be trained and supervised by female workers (nutrition aids or supervisor-trainers known as "monitrices" in Haiti). These local women must have completed primary school, be highly motivated, and willing to learn and apply basic nutrition principles, as well as the techniques for the "positive deviant inquiry" (PDI). They supervise, and must in turn be regularly supervised. They must be committed to improving the quality and the implementation and evaluation methods for HEARTH. In Haiti and in Vietnam, supervisor-trainers are also trained in communication (how to teach mothers and transfer skills). They or their supervisors must be able to participate in local market surveys, and use local food value tables to calculate the vitamin, calorie and protein values of a given menu. They must have competency in recruiting and training local volunteer mothers to conduct the HEARTHs. They must master skills to carry out monitoring and evaluation requirements, and these will vary from country to country, but must be decided upon before the programme starts.

The HEARTH menus

The daily HEARTH menu, in the form of an "extra meal" and snack, ideally must offer at least 700-900 calories and 25 grams of protein as well as adequate micronutrients, especially Vitamin A and iron. The supervisor-trainer is responsible for this. Malnourished children require up to 150 cals/kilo/day, so the foods found in the PDI may need to be made more calorie-dense (23). In order to accomplish this, participant mothers must agree not to deny the child his or her portion of the family pot, once back at home (6,5).

Community preparation and participation

Well supervised multiple visits to communities to help them make their own "community diagnosis" of malnutrition are necessary. Community leaders can create pie diagrams in order to explain the proportion of children needing rehabilitation. They must be informed of the determinants and consequences of malnutrition. A "positive deviant inquiry" during home visits is a prerequisite to every HEARTH exercise. Community participants seek out "the three goods" (good behaviours) during home visits: child feeding practices, health seeking behaviours and caring practices.

Respecting the principles of participatory adult education and the PDI

If the PDI is dropped, community participants see the menu as being imposed instead of realizing it came from their own successful mothers or caretakers. If mothers are "preached at" instead of counselled, if they are denied the privilege of participating in-group discussion the HEARTH programme will miss its mark. Regular supervision will help guard against this pitfall. Nutritionaids may tend to find it boring and repetitive. They must be encouraged to continue to allow adults to discover for themselves (22).

References

- 1. Zeitlin M, Ghassemi H, Mansour M, Levine RA et al. Positive deviance in child nutrition: With emphasis on psycho-social and behavioural aspects and implications for development. *Tokyo: United Nations University Press*, 1990.
- Wollinka O, Keely E, Burkhalter B, Bashire N (Eds.): Hearth nutrition model: Applications in Haiti, Vietnam, and Bangladesh. Arlington, VA: BASICS, World Relief BASICS, 1997.
- 3. Sternin J, Choo R. The power of positive deviancy. *Harvard Business Review*. 2000;**1**(1):1-2.
- 4. Collaborative resources for child survival (CORE) Group. BASICS II, Trainer's Videotape on HEARTH available from Basics II. *Arlington, VA: BASICS*, 2001.
- Sillan D. et al. The hearth nutrition model: Using the positive deviance approach: An implementor's handbook. Child survival collaborative and resource group (CORE Group), a joint CORE/Child Survival Technical Service (CSTS) publication, USAID sponsored. Washington DC: C/O CORE, 2002 (in press).
 Sternin M, Sternin J, Marsh D. Designing a community-based nutrition (Context)
- 6. Sternin M, Sternin J, Marsh D. Designing a community-based nutrition programme using the HEARTH model and positive deviance approach- A Field Guide. Westport, CT: Save the Children Federation, Inc, 1998.
- 7. Berggren W, Berggren G, Ewbank D. Reduction of mortality in rural Haiti through a primary health care programme. *N Engl J. Medicine*. 1981;**304**:1324-1330.
- 8. Berggren G, Hebert J, and Waternaux C. Comparison of Haitian children in a nutrition intervention programme compared with children in the Haiti National Nutrition Survey. *Bull. World Health Organ.* 1985;**63**(6):1141-1150.
- 9. Berggren G, Alvarez M et al. The nutritional demonstration foyer: A model for combating malnutrition in Haiti. Ma., Monograph Series No. 2. *Cambrigde: HOVIPREP, MIT Press*, 1984.
- 10. Harvard Centre for Population and Development Studies. Sanctions in Haiti: Crisis in humanitarian action. Programme on Human Security Working Paper Series, Harvard Centre for Population and Development Studies. *Cambridge: Harvard School of Public Health.* 1993.

- 11. Bryant J. Origins, evolution and prospects for primary health care in a changing world. In Rohde J, Wyon J (Eds.): "Community based health care: Lessons from Bangladesh to Boston". *Boston: Management Sciences for Health*, 2002.
- Burkhalter B, Northrup R. Hearth programme at the hospital Albert Schweitzer in Haiti. In Wollinka O, Keeley E, Burkhalter B, and Bashir N (Eds.): "HEARTH Nutrition Model: Applications in Haiti, Vietnam, and Bangladesh". Arlington, VA: BASICS, World Relief BASICS, 1997.
- 13. Dubuisson S. *Paper:* Impact of foyers de demonstration nutritionelle in the Save the Children Impact Area presented at ADRA sponsored workshop Nutrition Intervention in Haiti in the Plateau Centrale and presented in part to Child Survival Workshop sponsored by USAID and others. *Port au Prince, Haiti: Save the Children Field Office Archives*, 1998-1999.
- 14. Trinh A, Marsh DR, Schroeder DG. Sustainable positive deviant child care practices and impact on child growth in Vietnam. Food and Nutrition Bulletin Supplement on Positive Deviance. Food Nutr Bull. Tokyo, Japan: United Nations University press, 2002 (in press).
- 15. Sternin J, Sternin M, Marsh D. Scaling up a poverty alleviation and nutrition programme in Vietnam; and Introduction. In Marchione TJ (Ed.): "Scaling up, Scaling down". *Williston, Vt., USA.: Gordon and Breach,* 1999.
- 16. Levinson J, Ahrari M. Quantitative and qualitative assessments of positive deviance-based nutrition interventions in Minia Governate, Egypt. *Report to Save the Children USA in Egypt*, 2000.
- 17. King KW, Fogere W, Hulaire A, Webb RE, Berggren W, Berggren G. Preventive and therapeutic benefits in relation to cost: Performance over ten years of mothercraft centres in Haiti. *Am J Clin Nutr.* 1978;**31**:679-690.
- 18. Beggren G, and Berggren W. Report to the National Library of Congress, Schweitzer Symposium, May 2002, "History and results of community health in Haiti". *Washington, D.C.: Natl Library of Congress*, 2002.
- Beaudry-Derisme MMN. Nutrition rehabilitation centres: an evaluation of their performance. J Trop Pediatr. 1973;19:299.
- 20. Vella J. Four Types of Learning Tasks. In Vella J : "Taking learning to task". San Francisco, Ca.: Jossey-Bass, 2001.
- 21. Berggren G, Elmer M. Community-based HEARTH programmes and participatory adult education: underlying principles. Durban, South Africa: Proceedings of Conference, International Christian Medical/Dental Association. *ICMDA Press*, 1998.
- Elmer M. Hearth model's use of social learning theories and adult learning practices. In: Wolinka et al. (Ed.): "Hearth nutrition model, applications in Vietnam, Haiti and Bangladesh. Arlington, VA: BASICS, World Relief BASICS, 1997.
- 23. WHO. Management of Severe Malnutrition: a manual for physicians and other senior health workers. *Geneva: WHO*, 1999.

General recommended references for the subject

- 24. Beghin I, Fougere W, King K. L'alimentation et la Nutrition en Haiti. Paris: Press Universitaires de France. 1990.
- 25. Berggren WL. Evaluation of the effectiveness of nutrition rehabilitation and education centres. In: White PL (Ed.): Proceedings of the Western Hemisphere Conference on Nutrition, III. Chicago: Dept of Food and Nutrition, Division of Scientific Activities. *American Medical Association Press*, 1971.
- Collaborative Resources for Child Survival (CORE) Group. BASICS II, Report on Hearth Technical Advisory Group Meeting, April 11-12. Arlington, VA: BASICS, 2000.

- 27. Cribbin M. Application of a positive deviance inquiry in the Oruruo Altiplano. *Evaluation of the field guide*: Designing community-based nutrition programmes using the HEARTH model and the positive deviance approach. Master's Thesis. *Atlanta: Emory University Dept of International Health, Rollins School of Public Health,* 2000.
- 28. Genebo, Timotewos, Girma Woldemariam, Haider, Jemal, Demisse, Tsegaye. Factors contributing to positive and negative deviances in child nutrition. *Addis Ababa, Ethiopia: Ethiopian Health and Nutrition Research Institute*, 1998.
- 29. Lapping K. Positive deviance inquiry and malnutrition case control study among Afghan refugees in Haripur. *Pakistan: MWFP, Report to Save the Children,* 1999.
- 24. National Institute of Nutrition of Colombia. A practical guide to combating malnutrition in the pre-school child: Nutrition rehabilitation through maternal education. Report of a Working conference on Nutrition Rehabilitation, Bogota, Colombia, 1969. New York: Appleton-Century-Crofts Educational Division, Meredith Corporation, 1970.
- 25. Waverly R. National Hearth Workshop Report, Guinea, West Africa, Africare Report to USAID/Guinea, UNICEF/Guinea, and the Department of Health of the Ministry of Health of Guinea, Feb. 2000.
- 26. Zeitlin M. Child Care and Nutrition: The findings from positive deviance research. Medford, MA: Report to Tufts University School of Nutrition, 1992.

Resources

- 1. UNICEF. The Care Initiative, Assessment, Analysis and Action to Improve Care for Nutrition. *New York: UNICEF Nutrition Section*, 1997.
- 2. Academy for Educational Development (AED) LINKAGES Project. Washington DC: Applied Research Updates, Academy for Educational Development, 1999.
- 3. LINKAGES. Facts for Feeding, Academy for Educational Development. *Washington DC*, 1999.
- 4. WHO. A Critical Link, Interventions for physical growth and psychological development, Child and Adolescent Health and Development. *Geneva*, 1999.
- 5. Feuerstein MT. Partners in Evaluation, *MacMillan*, *IIED*, Participatory monitoring and evaluation. *SARL. London*, 1998.
- 6. Srinivasan L. Tools for community participation, a manual for training trainers in participatory techniques. *UNDP*. NY, 1990.
- 7. Red Barna SC. Norway video on Nepal: this is a training video in Nepalese and English, lasting 37 minutes. It is based in the Hill country.

IMPROVING CHILD HEALTH IN MYANMAR

Emma Roberts¹

The following presentation will consider the Save the Children – US Positive Deviance Nutrition Programme in Taik Kyi Township, Yangon Province, Myanmar. It looks briefly at the process that was undertaken and then raises a number of issues identified during an evaluation visit made to the project in December 2000.

The Nat Chung Village tract – part of the Taik Kyi township is made up of 14 villages under one chairman. Within the village tract there are a number of different ethnic groups represented and villages would appear to divide along ethnic lines. However within the groups of villages there is a degree of "community" felt – a factor necessary for the Positive Deviant approach to work.

The Project was set up as a "Pilot" during 2000 – beginning with a nutritional assessment that was undertaken during March 2000 in 14 villages where a malnutrition rate of 49% was found – using weight for age as the indicator of choice. Following presentation of the findings to members of the community and a commitment gained that the community wanted to be involved in addressing the issues of malnutrition within the village tract, volunteers from each of the 14 villages were identified. The volunteers then received training on the measuring of children, and also how to carry out the participatory situation analysis as well as the whole positive deviance process.

A participatory situation analysis then took place, the stated aims of which were to:

- Enable the Save the Children team and the villagers to get acquainted at the beginning of the project collaboration;
- Discover the current feeding, caring and health seeking behaviour in the community regarding children under three, in light of the baseline survey revealing a very high malnutrition rate of 49% in that age group (appendix A for various practices identified);
- Mobilize the villagers around child care and health issues in their communities and elicit their commitment to combat malnutrition in young children.

More than 60 mothers of children under 3 participated in the process through a number of focus group discussions and individual conversations and a number of home visits were also carried out. Other members of the community – traditional birth

¹ Save The Children UK. South East Asia and Pacific Region

attendants, village elders, fathers and older siblings were also involved in some of the activities that took place.

Out of this process a Child Health and Development Group was formed with responsibilities for growth monitoring, immunization mobilization, births and deaths recording and also to be involved in general health campaigns within the villages.

The Positive Deviant Inquiry (PDI) was then undertaken by the villages elders and the volunteers: All children under three were measured and then the children divided up into those that were well nourished – 'green' the moderately malnourished – 'yellow' and the malnourished 'red'. A coloured stick was taken and broken up to show the proportions of healthy and malnourished children. The question then asked was "are there children that are 'green' that come from poor families? The suggestion was then made that it is from these families that the community should learn what they have to do to have a well-nourished child. The emphasis of this part of the process is very much the "discovery" that poor families can have well-nourished children.

Families were then divided with those that had children < 3 years of age that were normal – "well nourished" then being wealth ranked. Those poor families were then measured against the following criteria:

- Child must not be an only child;
- Child cannot be less than 6 months;
- Child must belong to a family with a minimum of three children;
- Child should be a girl preferably because the baseline survey revealed that more girls were malnourished than boys.

Families are then visited and through a process of interviews and observations the "positive deviant "activities are identified. (See appendix B for full list of activities identified)

The next stage of the project can be seen to be divided into monthly cycles with Nutrition education sessions (NERS) held for 10 consecutive days at the beginning of each month – lasting between 2 and 3 hours each day. Mothers of the malnourished children identified are expected to attend for the session each day, bring food to cook, take turns at cooking the food and also participate in nutrition education sessions. The sessions take place in the home of one of the mothers or occasionally in the home of the volunteer.

Nutrition teaching takes place each day and covers the following five topics:

- Food and body hygiene
- Breast-feeding
- Prevention and treatment of illnesses

- Child care and development
- The balanced diet

Each topic is taught twice during the 10-day cycle to allow for reinforcement of the message and to be sure that mothers who miss a session don't miss out on one part of the curriculum. The volunteers use ready-made visual aids and are trained in the messages that they need to explain to the mothers. Mothers are encouraged to discuss and ask questions, although volunteers vary as to how 'interactive' the sessions are.

Children are weighed on the 1st and the 10th day and their weight recorded on their growth charts. Those that gain sufficient weight and reach the "green" level on the growth chart, "graduate" from the programme. Foods used in the NERS sessions are identified through the PDI and mothers are expected to bring a contribution that increases so that by the end of the 10 days they are asked to bring almost all the foods except the oil and the peanuts. These ingredients are provided by Save the Children US through the project funding.

The full food ration given each day to the children in the NERS sessions is as follows:

- Rice 50g
- Oil 10g
- Peanuts 15g
- Egg 65g
- Fish/shrimp 31g
- Green Leafy Vegetables 80g

Which provides a total of 548.75 Kilocalories and 24.6g protein.

Using a food chart with the foods divided into 3 groups – the "GO", "GROW" and the "GLOW" foods as promoted by the Myanmar "National Nutrition Centre", mothers are taught how to make up a balanced diet for their children. By bringing a contribution, mothers get into the "habit" of providing these foods for their children. They also learn that some of the local beliefs about these foods (e.g. Fish gives children worms, vegetables give children diarrhoea) are untrue and that their children can gain weight on the diet.

For the remaining 20 days of the month the mother is encouraged to feed her child the same foods at home. The child is reweighed at the beginning of the next month to see what progress has been made with the expectation that the child will have continued to gain weight as it has continued to be fed the additional food at home.

Growth monitoring of all children under 3 takes place in the villages every second month to identify new children to be included

in the programme and also to continue to monitor children once they have "graduated" from the NERS sessions.

The positive deviance approach:

Advantages

Community Based

By involving the community at all stages of the process, the community themselves will have the opportunity to work out why their children are becoming malnourished and also can see that not all poor children are malnourished - as is often thought to be the case. The community can themselves identify what works for some families and learn to replicate these activities within their own homes. Therefore solutions are "home grown" rather than suggested by outsiders. The community can also provide support to mothers and their families, as they are involved in the NERS sessions.

Positive Emphasis

Looking at what works rather than what doesn't, by taking a more positive approach. This is unusual. Many programmes concentrate on knowledge gaps and what mothers are doing wrong rather than putting the emphasis on what is working.

Mothers' contribution

Mothers learn by doing – and obviously take pride when their children "graduate" into the green category on the chart.

Use of volunteers from the community

The programme uses highly motivated volunteers, mostly women to implement the programme and this is very positive as each are a member of the community and so are an integral part of the process. They know the families well and the needs of each family and can easily work to support the families over the lifetime of the project.

Issues with the approach

Within the Myanmar example there are a number of issues that can be identified with the approach and also the outworking of it in this project.

The small number of positive deviant families identified

There is a clear criteria for positive deviant families. In this case only 4 children from the 150 were found to fit the criteria and in reality none of these strictly fit – as 3 were male children and the 4th came from a family of only 2 children. The criteria themselves may constitute positive activities – i.e. small families may have less malnourished children, culturally boys may be fed before girls and therefore receive the better food. This was not considered within the process.

Cross checking of activities

By looking at what families with healthy children are doing but not cross checking, there is a risk that these same practices are being used by families with malnourished children and therefore these may not be the actual practices that are making the difference. There is a tendency to take any "good practice" seen or mentioned in the homes of the identified positive deviant families and take these as positive deviant activities. In this case activities mentioned in only one home were taken as positive deviant activities. Many of these practices were probably also being practiced in homes where children were getting malnourished.

What to do if there are no positive deviant activities

If there are no obvious activities what happens then. In the Myanmar case it seems that general good practice was promoted while any good activity that was identified by one family was used. While the community approach added some benefit it is difficult to say what the added benefit was of the positive deviant approach when the activities promoted could not be clearly seen to be making a difference within that community.

Sustainability

Behaviour change is very difficult to achieve and the Positive Deviance approach does not necessarily address the reasons why mothers feed their children on certain foods and why they use certain care practices. When talking to mothers in the NERS sessions it was clear that while they would bring the foods to the sessions and that they understood that these foods were good for their children, they stated that they would not be able to continue for the remainder of the month due to the costs involved. Therefore while the education had taught them what they could do – their economic conditions dictated that they would not be able to change behaviour. This finding is borne out in the reweighing statistics within the project, which found that of those discharged having attended one set of 10 NERS sessions, 53.3% lost weight and needed to be readmitted. This figure did decrease to 25.9% for mothers that had attended 3 months of sessions but this still means that 24.1% of mothers are unable or unwilling to change their behaviour after continual inputs for a 3-month period.

Caregivers

One of the key concerns in the Myanmar situation is that of the main caregiver. As in many South East Asian villages – mothers have an important role to play within the agricultural production process and this means that the main caregiver is often a grandmother, or more likely an older sibling. In one NERS session, there were 5 young boys - aged between 6 and 9 who brought their younger siblings to the session. This means that the nutrition education is not reaching its intended target and also that the mothers are not learning to prepare the new foods. One of the main causes of malnutrition in these young children is because they are not fed often enough, an issue identified during the PLA process. Mothers leave the house at six in the morning and don't return until it gets dark. Older siblings are in charge to the younger children and only feed when they themselves are hungry. Reweighing sessions also take place during the day and so in many cases the mothers cannot be involved as they have other responsibilities. Therefore the opportunity for individual education and encouragement is lost

Wet versus dry feeding

There is no doubt that providing cooked food allows the volunteers to watch the mother/caregiver feeding her child and also allows the mother to practice cooking the different foods – some that she may have never cooked before. However due to time constraints – some of the children are expected to eat a large meal in a short time – which they cannot do. Also as has already been mentioned many mothers cannot attend the sessions, as they simply do not have time to be there for 2-3 hours a day for 10 days. They may attend for one session and then send another family member with the child. There is no food provided for the carer and so often older children – that are hungry themselves are expected to persevere and feed a younger sibling while receiving nothing themselves. Often an older sibling will therefore share some of the food and so the child will receive less than is intended.

Supplementation or substitution?

With food in short supply it is likely that a child receiving a meal at the NERS will not receive another meal – i.e. the meal will replace one that would normally be given by the family and so there is a substitution rather than a supplementation effect. While the meal given is likely to be of a higher nutritive value and so there is some advantage to the child, the amount given is still low, around 500 kilocalories and so there is a potential devaluing of the additional food.

Ration Scale used

The programme only provides 500 kilocalories/child/day – which is considered low when programming for supplementary feeding. Emphasis is on the variety of foods involved but there is also a requirement to have all foods every day. Therefore the message is given that there needs to be a mix of foods each day – rather than providing fish one day and peanuts another day – which is a much more realistic diet for these families.

Provision of food by SC US

SC US provide the two foods that contain the highest number of kilocalories and therefore will make a considerable contribution to the weight gain of the children while attending the NERS sessions. These are foods that mothers may have difficulty being able to afford themselves and therefore there is a dependency on the organization for the energy dense foods. This may distort the weight gains achieved during the NERS sessions and also question the sustainability of the project. With a dependency on outside food the community is not actually feeding its own children back to health and it means that should the input from the external agency end then the project is unlikely to continue.

Cost of food

This issue is linked to sustainability as it was found that mothers – accepting that they could give different foods to their children and that these foods were good, admitted that they would not because they could not afford to do so. Therefore it can be seen that unless the programme actually addresses some of the underlying poverty issues as well it is unlikely that the impact will be maximized.

Time for volunteers

The programme depends on its volunteers to work very hard to mobilize the mothers. Volunteers are expected to visit families during the 20 days that the NERS sessions are not happening, encourage mothers to bring foods and fuel to the sessions and also to carry out the growth monitoring on a regular basis. It is clear from the villages visited that the volunteers that put in the hours do get better results. Many of the volunteers are busy mothers themselves and therefore care needs to be taken to not overload them with demands.

Using weight/age

While weight/age is an indicator of chronic poverty and therefore should be the correct measure to use – along with height for age, both have problems, as age is often very difficult to determine. Many children have no record of age and small errors in the age can make the difference between a child being included and not being included within the project. Therefore there may be a need for some more general interventions so that families don't miss out from the education being provided.

Conclusions

The original Positive Deviant Project was set up in Vietnam and achieved a recognizable impact on nutritional status as clear positive deviant activities were identified that were replicable by all mothers with minimal additional cost or time.

However in the Myanmar experience, where no clear PD activities were defined the programme was devised promoting general best practice. Activities that were known to be "good" were promoted if mentioned by one family. Foods were also used within the NERS sessions that were not mentioned within the positive deviant inquiry but were chosen by the team as available at low cost within the village setting. However while available there was a cost involved and this was sufficient to put them out of reach to most mothers on a regular basis. This had the effect of promoting a feeding practice that was desirable nutritionally but not achievable.

The model strongly promotes the role of the mother as the caregiver and the person whose behaviour is expected to change. It was unclear how to deal with the situation where the daily care for the young children is by older siblings. Nutrition education was not tailored to this age group – while the rigid structure of daily NERS sessions precluded many mothers from attending. The growth

monitoring activity also takes place during the day, when the team is able to visit and so mothers are unlikely to be able to regularly attend this part of the process either.

While recognizing the positive benefits of the approach there is a need for more flexibility to be built into the implementation process. Growth monitoring sessions, with education could perhaps take place in the evenings to enable mothers and other members of the community to attend. Support to young caregivers is also important as they clearly have a role to play in the care of young children but must not themselves lose out by being involved in the NERS sessions. Steps should also be taken to work with the communities to address some of the other root causes of the malnutrition - economic and social rather than only focusing on behaviour.

APPENDIX A: Summary of current feeding, caring, health seeking behaviour regarding children under 3

Feeding Behaviours	Caring Practices	Health Seeking Habits
 Feeding rice to babies under 4 months old Young children not fed regularly Not enough food per meal No variety of food except oil and salt Feeding non- nutritious snacks like puffed stick like cakes Infrequent feeding Rice water discarded 	 Child not supervised at meals Child with poor appetite not coaxed to eat Older sibling not trained to look after younger children Child left to play by himself Young caregivers do not want to play with toddlers or babies Fathers not involved in child caring 	 Food Hygiene Vegetables not washed thoroughly Uncooked food placed on dirty surfaces Cooked food not covered at all times Hands not washed with soap before handling food Leftover food not heated before eating Body Hygiene Hands not washed with soap before eating Children's hands and face not washed with soap before and after feeding Hands not washed after going to the latrine Fingernails not cut regularly Environment Hygiene Floors not swept properly Tables for meals not washed Pigs, ducks, chickens and hens not kept in sites or coops Pots and pans not washed with soap after use Preventative and Curative Practices Iodized salt not used Late treatment of sick children Do not know how to use ORS salt Immunizations shunned because of fever

APPENDIX B: Selected Behaviours for Nutrition/ECCD Project 8/00

Feeding Behaviours

- Complementary feeding by 6 months
- Feeding the young child 4-6 times a day: 3 meals + snacks
- Feeding the young child a good amount of food per meal
- Feeding the young child a variety of food such as eggs, fish, beans and vegetables
- Cooking food with enough oil
- Feeding the young child nutritious snacks

Caring Practices

- Caregivers practice active feeding and supervise child at meals
- Caregivers play and sing with child
- Older sibling is trained to look after the younger child
- Caregivers encourage child with poor appetite

Health Seeking Habits

Food hygiene

- Washing vegetables at least 3 times
- Keep uncooked food in safe place
- Cover food at all times
- Wash hands with soap before handling food
- Heat up left over food before eating

Body hygiene

- Wash hands with soap before and after feeding child
- Wash child's hands and face before and after feeding
- After going to latrine wash hands with soap
- Check children's nails regularly and cut nails if necessary
- Environmental hygiene
- Sweep floor before and after eating
- Clean bowls, spoons, pots and pans with soap and ashes after use

Preventative Practices

- Use of iodized salt
- Identification of danger signs (Looks unwell, refuse to play, not eating or drinking, lethargic, experiences changes in consciousness, vomits frequently, has high fever, has fast and difficult breathing)
- Home treatment of the sick child
- Home made ORS
- Immunization.

References

- Sternin M, Sternin J & Marsh D. Designing a Community-Based Nutrition Programme Using the Hearth Model and the Positive Deviance Approach – A Field Guide. Save the Children, December 1998.
- Save the Children US. Report on the Participatory Situation Analysis and The Positive Deviance Inquiry. Nutrition/ECCD Project – Yangon Division, Yangon. August 2000.
- 3. Roberts E. Report on Assessment of the Save the Children US, Positive Deviance Nutrition Programme. Myanmar. Save the Children UK, December 2000.

PREVENTIVE CHILD SUPPORT IN BELGIUM

Nadine De Ronne¹

At the beginning of the 20th century, bad hygiene mainly in preparing bottle feeding and prematurity were the main causes of high infant mortality which was in discrepancy with a better life expectancy for children and adults.

Private initiatives started all over Belgium giving free preventive advice to the young mothers in the infant welfare clinics in order to prevent this dramatic phenomenon. These private initiatives were controlled by one authority, the 'Nationaal Werk voor Kinderwelzijn (NWK)'or 'National Action for Child Welfare' founded in 1919. This organization fulfilled a unique role concerning infant welfare in Belgium since 1920, and significantly contributed to a substantial decrease of infant mortality.

In order to reduce perinatal mortality due to prematurity and maternal morbidity, prenatal monitoring clinics were started in 1930. They tried to make pregnant women aware of the importance of good prenatal monitoring by supplying information, in cooperation with maternity hospitals.

Developments in medical science were not in line with actual needs at that time. When the social situation was improving, the issues doctors were dealing with had to change. The urge for advice involving only hygiene and food preparation decreased. Vaccination, child development and social issues became part of routine preventive care.

As access to medical care became universal (1945) and the number of physicians increased, the role of therapeutic and preventive child health care had to be redefined. Prevention became available not only in the public preventive setting but also in the 'private' setting: anticipatory guidance, screening for infections and metabolic diseases, and implementation of a comprehensive vaccination programme. The difference between the two settings is that parents have to pay for private consultations (co payment); welfare clinics are entirely free of charge.

When NWK stopped its activities in 1986 and its role was taken over by Kind en Gezin (K&G) in Flanders and the Office de la Naissance et de l'Enfance (ONE) in Wallonië, the vision of 'health' had changed even more from basic hygienic advice to a combination of growth, development, psychological support and pedagogic advice.

¹ Kind en Gezin, Belgium

From that moment on child support was no longer an exclusive medical issue, but became a multidisciplinary matter including medical, social, cultural, pedagogic and psychological advice.

Child support enlarged into family support.

Good health evolved from a medical concern aimed at lowering infant mortality into a condition of absence of disease combined with social and pedagogic welfare. The good outcome cannot be attributed to the efforts of one organization, but also to the cooperation with the other partners.

The preventive aims (screening, vaccinations, growth) can be monitored by means of electronic data collection implementing a survey output of the target group. This information is very important for everyone working in prevention and health care because it is the basis for programme adjustments.

IKAROS (Integrated Child Activity District Support System) enables nurses and physicians to learn about new births within hours instead of weeks so that babies' and mothers' health can be monitored more quickly. Information can be exchanged smoothly. Kind en Gezin focused on state-of-the-art technologies to develop and implement this information system to automate timeconsuming management activities and pro actively monitor systems activity to improve performance and data.

Vaccination data from infant welfare clinics together with those from private settings will be gathered in the Flemish Vaccination Databank (Vacc Vlaanderen) in the very near future. With the aid of this databank all physicians (working in private as well as in community settings) will be able to enter the vaccination data of every child. Statistical data on the vaccination status of Flemish children will be accessible.

As a result of a long research, Kind en Gezin started in 1997 a generalized programme of systematic neonatal hearing screening integrated in the existing preventive setting; the Algo-test (Automatically Auditory Brain Response-test) can detect hearing problems simply and effectively on a very young age of 2-4 weeks in order to start with new methods of treatment at an optimum age.

The relationship between K&G and healthcare medical associations remains very delicate, but working together and listening to each other can help a good deal. Actually, we all have the same aim: promoting the health of our children.

References

- Velge H. De bedrijvigheid van het Nationaal Werk voor Kinderwelzijn tijdens vijf 1. en twintig jaar (1915-1940). Brussel: Drukkerij van het Office de Publicité.
- 2. Velge H. De bedrijvigheid van het Nationaal Werk voor Kinderwelzijn tijdens de oorlog (1940-1945). Brussel: Drukkerij van Office de Publicité.
- 3. Vandenplas Y. Witboek van de Kindergeneeskunde. AZ VUB Laarbeeklaan 101, 1020 Brussel.
- Regionale hoorzittingen over het Strategisch Plan Preventieve Kinderzorg. 1995 4.
- 5. Syllabus Preventieve Kinderzorg, Kind en Gezin, 1996.
- Knops J, Vantongelen E. De historische evolutie van de zorg voor het jonge kind 6. in het kader van de raadplegingen van het NWK/ Kind en Gezin (opgenomen in symposiummap 08-10-1988, UZ Gasthuisberg, Leuven).
- 7. Blancke L. De preventieve kinderzorg in het consultatiebureau: overbodig of
- waardevol ? College Medisch Adviseurs, 1990. Pelckmans. Er is leven na de dood. Tweehonderd jaar gezondheidszorg in 8. Vlaanderen. Kapellen, 1998.
- 9. Rudolf MC et al. A search for the evidence supporting community paediatric practice. Arch Dis Child. 1999;80(3):257-261.
- 10. Barnes J, Stein A, Rosenberg W. Evidence based medicine and evaluation of mental health services: methodological issues and future directions. Arch Dis Child. 1999;80(3):280-285.
- 11. Hagelin E, Jackson K, Wikblad K. Utilization of Child Health Services during the first 18 months of life: aspects of health surveillance in Swedish preschool children based on information in health records. Acta Paediatr. 1998;9:996-1002.

THE IMCI STRATEGY IN THE REGION OF THE AMERICAS: IMPACTS ON INFANT MORTALITY, HEALTH CARE QUALITY AND CHILD DEVELOPMENT

Yehuda Benguigui¹

Introduction

Improving people's health continues to be a major challenge for developing countries (1) and its prioritization in relation to children is critical (2). Simple prevention and treatment measures have been available during the last two decades, but still each year many children die or suffer from frequent episodes of diseases that can be easily and effectively prevented or treated (3). In some cases, those diseases result in temporary or permanent disability, with severe negative consequences for children's growth and development.

The lack of access to available interventions for the prevention and control of those diseases, and inadequate care practices for children at home, with such negative consequences for children and their families, are due to a lack of information regarding healthy behaviours (3), lack of access to health personnel, and/or health facilities able to provide adequate treatment when a child is sick. Other deaths, and many episodes of diseases, could be avoided if children would receive health prevention measures, or if they were in better nutritional condition, the latter resulting from appropriate breastfeeding, weaning and feeding practices (4).

To reduce the incidence and severity of children's diseases, families must have access to available strategies for prevention and treatment. Families also need access to information for health promotion, in order to improve current practices for caring children at home, thereby contributing to improving children's growth and development. However, resources for increasing population's access to health facilities and for a broad dissemination of information are scarce in most developing countries (5). Thus, the main challenge these countries face is to find ways to make a more efficient use of available resources for providing good quality care to children and their families and to disseminate key information for improving parents' practices of children care in the home.

In support of countries' efforts, the World Health Organization (WHO) and the United Nations Found for Children (UNICEF) worked

¹ PAHO/WHO, Washington DC, USA.
together to elaborate a single strategy to improve the quality of care that children receive at home and at health facility levels (6). The strategy was designed to focus on the children's health condition as a whole instead of children's specific diseases, so as to avoid missed opportunities for early detection of problems and allow parents and health workers to take the appropriate actions.

The integrated management of childhood illness (IMCI) is the result of this joint effort and brings together all the previously available interventions for improving children's health. Moreover, by adapting the strategy to the particular epidemiological situation where it is applied, more actions for health promotion, prevention and treatment may be added, taking into account the availability of resources and the specific operative conditions of the country or region (7). By operating in this manner, IMCI increases the ability of health workers and parents to provide better quality care for children.

In the Region of the Americas, the Pan American Health Organization (PAHO), which acts as the regional office of WHO, launched IMCI in 1996 (8). From that year through 2001 seventeen countries have adopted the strategy, made adaptations to their particular epidemiological and operative conditions, and began its implementation². Initial implementation targeted regions and areas with child mortality rate higher than 30 per 1.000 live birth, so as to broaden the important impact that IMCI would have in those particular contexts. Further expansion is currently underway in most countries, and IMCI is being used in most regions and areas, including those with lower IMR, due to the benefits of the strategy for children's quality of care at health facilities and at home.

An overview of childhood mortality and morbidity in the region of the Americas

PAHO estimates that more than half a million children under five die each year in the Region of the Americas, and around one up to three of those deaths are from infectious diseases and malnutrition (Figure 1). The importance of those diseases in the overall mortality of children under five is different and reaches 40% and more in some developing countries, while it is as low as 5% in developed countries of the Region³.

² Organización Panamericana de la Salud/Organización Mundial de la Salud.

Evaluación intermedia de la iniciativa "Niños Sanos: la Meta de 2002". (en prensa) ³ Organización Panamericana de la Salud/Organización Mundial de la Salud. Las

Condiciones de Salud de las Américas. Edición de 2002 (en prensa).



Figure 1: Distribution of deaths in children under five years of age in the Region of the Americas. Estimates from 1999

Source : Pan American Health Organization. Special Programme for Health Analysis (SHA) and Communicable Diseases Programme (HCT). 2001.

Diarrhoeal diseases and pneumonia are the leading causes of those deaths; and malnutrition contributes also to the death toll, being the main or the associated cause of most deaths from infectious diseases during childhood.

Infectious diseases are also the main cause of sickness during childhood. Acute respiratory infections, for example, affects children's health at an average of four to five times a year during their early years; and in many developing countries, diarrhoea is also an important cause of children's disease (9-14). ARI and diarrhoea, together with other infectious diseases, are then the cause of half or more of all hospitalizations in children under five, and the cause of 70% or more of all consultations to health facilities (Figure 2) (15).





Source: Pan American Health Organization. Special Programme for Health Analysis (SHA) and Communicable Diseases Programme (HCT). 2001.

Multiple factors account for this situation. The lack of knowledge and adequate practices for caring children at home place children in a greater risk for suffering infectious diseases and make them more severe when they hit the child (16). Lack or inadequate breastfeeding, poor weaning practices, inadequate feeding, and lack of hygiene, among others, are important causes of children being at risk of catching an infectious disease (17,18). Inability to perceive danger signs to look for care outside the home, together with less than adequate health providers, are additional problems that contribute to treatment delays and increase the risk of death (19-23).

In addition, large portions of the population have limited or no access to health facilities or personnel, which in turn reduces the chances for children to receive prompt care when sick or having access to preventive measures such as vaccination (24). In some cases, even though health facilities or personnel are available, the quality of care they provide is poor or limited (25). Short schedules for providing care, lack of medicines, difficult referral services for complementary diagnostic or treatment techniques, and even inadequate training of health workers are some of the main causes of poor quality care at first level health facilities.

Several specific interventions were implemented during the last decades to face these problems, vaccination probably being the most vastly known and the most successful *(26)*. Interventions like the standard case management of diarrhoea or ARI were also an important contribution, not only to reduce mortality and morbidity, but also for improving the quality of care children receive at home and at health facilities *(27-29)*.

A problem with the implementation of those strategies, however, was promptly identified: the use of single and specific strategies does not help health workers to see the child as a whole (30-31), and missed opportunities for detection of problems other than the cause of consultation were frequent (32-34). Those specific strategies also failed to disseminate systematic information and education regarding care of children at home, thereby failing to take advantage of the moment of consultation with the health worker or facility.

The integrated management of childhood illness strategy

The Integrated Management of Childhood Illness (IMCI) is a single strategy elaborated by the World Health Organization (WHO) and the United Nations Fund for Children (UNICEF). This strategy brings together all the available interventions for the control and prevention of the main causes of disease during childhood, and for health promotion of the growth and development of children (6). In its basic design (35-36), IMCI includes first checking for the main symptoms of common diseases affecting children in developing countries; thus including severe diseases such as pneumonia or meningitis, acute respiratory infections, diarrhoeal diseases, malaria and otitis. Secondly, IMCI includes the assessment of the child's nutritional condition, and immunization status. Finally, IMCI provides all the instructions for treatment, including administration of medication, recommendations about how to care for the child at home, next control visit for checking progress of treatment, and when to seek for care immediately due to the worsening of the disease.

The strategy was designed in a way that allows further adaptation to the epidemiological conditions of each country, or even region inside the country; and to the operational resources that are available for its implementation (37-38). This includes the category and training of health workers who will be using IMCI, the availability of medicines and diagnostic technologies, the reference systems from first level health facilities to hospitals, among others. The content of IMCI is not new, and is already included in several different strategies or in internationally disseminated bibliography (26-29). But IMCI brings together all that information in such a practical way that health workers, including not only physicians but also nurses and other auxiliary personnel, may use the strategy to provide care at first level health facilities. Therefore, IMCI results in the best available strategy for providing integrated and good quality care for children in developing countries where resources, both human and facilities, are very limited (39).

On the other hand, as the IMCI strategy provides information on practices for health workers and also for parents, its potential for improving children's care may be expanded not only to health facilities and health workers, but also to the family.

In sum, by applying IMCI health workers may provide a good quality of care each time they are in contact with a child (40). At the same times, parents following IMCI recommendations for treatment, prevention and caring children at home, will give them the best possible protection to their health and will contribute to promote their healthy growth and development (41).

For the above-mentioned reasons, the main strength of IMCI is its potential impact for reducing mortality, preventing diseases and improving the quality of care. This last by reducing missed opportunities for early detection and treatment of diseases and for disease prevention (42), through a more rational use of medication (43) and by using the consultation for improving the knowledge and practices of parent's for children's care at home (44).

IMCI was launched by WHO in 1996 and in the same year PAHO launched the strategy and began the first implementation in selected countries (8). From that initial year, 17 countries of the Americas are now using IMCI after adapting the strategy to the particular conditions of them⁴. Expansion of IMCI is currently underway, both including increasing the population covered by the strategy and the incorporation of new components for health prevention, treatment of diseases and children's health promotion.

Impact of IMCI on children's health. The *Healthy Children: Goal 2002* Initiative

On the basis of its potential impact, and the fast manner in which countries decided to implement IMCI, PAHO launched the initiative *Healthy Children: Goal 2002*, which proposes to reduce

⁴ Organización Panamericana de la Salud/Organización Mundial de la Salud. Evaluación intermedia de la iniciativa "Niños Sanos: la Meta de 2002". (en prensa)

100,000 deaths in children under five in the Region of the Americas during the period 1999-2002 (45). The initiative was proposed after analyzing the possibility of increasing the rate of reduction in childhood mortality, as a consequence of the expansion of IMCI strategy in countries, particularly providing access to the most vulnerable groups of the population, where most childhood deaths occurred.

First assessments made regarding mortality from diseases targeted by IMCI has shown an important reduction in the number, rate and percentage of deaths due to those diseases, when estimates for 1999 are compared with those for 1996. Analyzing data from the most important causes of mortality from diseases targeted by IMCI, that is diarrhoeal diseases and acute respiratory infections, a sustainable reduction is observed in the first one and an increasing rate of reduction in the last one (Figure 2).

Results from using IMCI were also obtained regarding the improvement in health workers performance and in parent's knowledge on how to adequately care for children at home. The use of inadequate medication for the treatment of ARI in the health centre "La Vicentina", in Quito, Ecuador, dropped by 95% by using IMCI. In the same centre, no antibiotics were used for the treatment of ARI no-pneumonia, but the use of antibiotics remained 100%⁵.

Assessments made in the Dominican Republic have also shown that the use of IMCI contributed to increase parental awareness regarding danger signs for early seeking of care from a health worker, and with regard to better care of children at home during diarrhoea and ARI episodes (44).

New perspectives for strengthening IMCI

Although the use of IMCI has all these benefits, some common child problems in developing countries are not widely covered by its content. This is particularly important in the Region of the Americas where mortality from diseases targeted by IMCI in its basic design represents less than 30% of all childhood deaths, with an increased rate of reduction in this burden⁶. In addition, health facilities and health workers using IMCI face also other health problems that children have, and which are the main reason for parents seeking

⁵ Gavilanes E, G, Flores V, C, Pavón C, M, Palma P, L. Impacto de la estrategia atención integrada de las enfermedades prevalentes de la infancia sobre el uso de antibióticos para el tratamiento de las IRA y las EDA en el centro de salud "La Vicentina" de la ciudad de Quito. (en prensa).

⁶ Organización Panamericana de la Salud/Organización Mundial de la Salud.

Evaluación intermedia de la iniciativa "Niños Sanos: la Meta de 2002". (en prensa)

care. These include, among others, obstructive respiratory diseases, such as asthma, accidents, child-abuse, and even some neonatal problems. Finally, although IMCI strategy has a strong component for prevention and health promotion, the content of these components are mainly related to the nutritional status, with no mention of developmental problems, i.e. their early detection and adequate treatment, together with the promotion of early stimulation.

Complementing the IMCI strategy by including the latter contents is becoming a priority, especially in the Region of the Americas, where some countries were already working on its design, with the support of the IMCI Regional Unit at PAHO.

Treatment and control of asthma and other obstructive respiratory diseases was one of the first contents that countries identified as necessary to be added to IMCI (46). One reason was because the assessment and treatment of wheezing mostly associated with obstructive respiratory diseases, was already part of the ARI control strategy, which was underway in most countries of the Americas. Moreover, asthma and obstructive respiratory diseases represent between 6% and 13% of all childhood hospitalizations and more than 25% of all children seeking care at first level health facilities. For this reason, the assessment and treatment of those problems takes at least one fourth of the time that health workers have at health facilities; and many of the children do not receive adequate assessment and treatment, including unnecessary or inadequate use of medication.

The other two contents that were identified as necessary to be included were the prevention and control of accidents, violence and child abuse, and the detection and adequately treatment of neonatal problems. This latter is a main problem, particularly in countries and areas were many children are born at home.

In the countries of the Americas, neonatal and perinatal problems represents the most important cause of death in children under one year of age: estimates from 1999 show that neonatal deaths accounted for more than 200,000 deaths, representing half of the total number of infant deaths (47,48). Although premature deaths were more than 40% of all those neonatal deaths, around 45% of all those deaths occurred after the first week of life.

Activities in progress regarding the neonatal component of IMCI' includes the design and field testing of clinical charts for under-one-month infants, linking IMCI with pregnancy and birth care centres and in coordination with health services and midwives for healthy childbirth.

Regarding accidents, violence and child abuse, which account for around 20% of all deaths in children 1 to 4 years old (49,50), clinical charts are also in the design process. These charts will lie out information to health workers for preventive recommendations to parents to avoid accidents during childhood. It will also provide health workers with practical procedures for early detection and treatment of child abuse. This last portion of additional IMCI content will also include a component for the support of community involvement in preventing and adequately treating child abuse and violence, and for preventing accidents at homes and in the community.

Two additional contents were identified to be included in IMCI, both related with further child growth and development that may have severe consequences if early measures are not taken: an oral health component and a developmental promotion component (51).

PAHO is currently working on the oral health component directed to promote early detection and treatment of cavities and to contribute to a more rational use of medication, especially antibiotics, which often are inadequately and unnecessary used.

The developmental component is considered essential to promote a healthy start in life for children, which results not only from a good nutrition and from keeping children free of disease. IMCI already contributes to promote development in children. On the one hand, by keeping them free from diseases and by improving their nutritional condition, on the other, by improving the capacity of parents to provide better care at home. To increase the power of IMCI for improving children's development, WHO and PAHO are working in designing and field-testing practical interventions that may be applied by health workers from primary level health facilities.

Support for implementing development care within IMCI has been part of WHO's work during the past few years and is currently almost ready for launching at country level. The proposed guidelines interventions includes for feeding, play and communication, adapted IMCI training materials, including modules for health workers, facilitators and supervisors guidelines, mother's counseling card and a training video. A series of technical seminars for decision-makers are part of the proposal, and will contribute to promote its adaptation and practical implementation in countries.

PAHO is also working on the basis of country experiences with the IMCI adaptation and implementation. Materials developed in Brazil include practical guidelines for the first level health facilities. These materials provide health workers a better understanding of developmental problems during childhood and give them practical procedures for early detection and treatment. The proposal currently being field-tested in Brazil also provides simple tools for teaching parents how to provide care to their children for a better development.

Facing the challenge for scaling-up IMCI

In this context of continuous expansion, IMCI is going to be a stronger strategy for improving children's health condition and for promoting healthy family behaviours that will contribute to a healthy start in life. And as the challenges for this expansion are big, the work to be done has to be bigger. The most important of these challenges (52) includes introducing IMCI in Universities, accelerating the pace of training on IMCI, including the new contents for health prevention and promotion and for early detection and treatment of diseases, strengthening the community component, and the mobilization of resources.

Introducing IMCI in Universities is key for increasing and sustaining access of the population to the strategy. First of all by training students before graduation to make them able to apply IMCI. In most developing countries students have to work during one year in a health facility after completing their regular courses of medicine or nursing, and this is a condition for graduation. These health facilities are usually serving the most vulnerable groups of the population, and having students trained on IMCI will benefit them. Secondly, training students in IMCI during their regular courses will contribute to reduce the burden that training represents for countries at this moment. Finally, introduction of IMCI at Universities will also contribute to support the sustainability of the strategy, given the important referent role that professors exercise among health workers and the population in general.

Expansion of training will result not only from teaching IMCI at Universities, but also from diversifying the available courses and workshops for training on IMCI with the simultaneous application of relevant quality control. Although expanding training is essential for increasing access to IMCI its enhancement will require additional support.

Incorporation of new contents into IMCI, as already described, is essential to strengthen the ability of health workers and parents to adequately deal with the most common childhood health problems and diseases, and for improving their capacity for providing children adequate care and the environment for a healthy growth and development. Thus, the 16 key family practices for improving children's growth and development have to be more widely disseminated, as proposed by the Interagency Working Group on the Community Component of IMCI (IAWG). Those practices summarize the most essential knowledge and practices that parents' need to use to caring for their children at home. Strengthening current efforts for increasing information, education and communication activities will contribute to have more children benefiting from adopting these practices.

But all the above can only be carried out if the necessary resources are obtained via their mobilization at local, national and international levels. Current national and international commitment to the improvement of children's health conditions has generated important results by providing practical tools for reducing mortality and morbidity and helping families to provide their children a good start in life. The challenge is now to ensure that, all the knowledge and practical instruments available can be reached by each single child in the world. The commitment to succeed in achieving such a daunting task is a critical condition for a new and better future for all.

References

- 1. Pan American Health Organization. Advancing the People's Health. Annual Report of the Director 2000. Official Document No. 298. *Washington, DC: OPS/OMS*, 2000;x-xxi.
- 2. The State of the World's Children 1998. Oxford University Press, 1993;p 6.
- Organización Panamericana de la Salud/Organización Mundial de la Salud. La Salud en las Américas. Publicación Científica No. 569. Washington, DC: OPS/OMS, 1998;71-76.
- 4. The State of the World's Children 1998. Oxford University Press. 1998;9-35.
- 5. World Development Report 1993. Investing in Health. Oxford University Press, 1993;1-16.
- Gove S. Integrated management of childhood illness by outpatient health workers: technical basis and overview. The WHO Working Group on Guidelines for Integrated Management of the Sick Child. *Bull World Health Organ*. 1997;**75** (Suppl 1):7-24.
- 7. World Health Organization. Integrated management of childhood illness: conclusions. WHO Division of Child Health and Development. *Bull World Health Organ.* 1997;**75**(Suppl 1):119-28.
- Organización Panamericana de la Salud/Organización Mundial de la Salud. Manifiesto de Santa Cruz. Encuentro Regional de coordinadores de acciones de control de las infecciones respiratorias agudas (IRA) y de las enfermedades diarreicas (CED). 9 de Febrero de 1996. OPS/HCT/AIEPI/97.5.
- 9. Instituto Nacional de Estadística e Informática. Encuesta Demográfica y de Salud Familiar. 1996. República del Perú. *Macro International Inc. USA*, Junio de 1997;151-159.

- Instituto Nacional de Estadísticas y Censos. Encuesta Nicaragüense de Demografía y Salud 1998, Nicaragüa. Macro International Inc. USA, Abril 1999; 146-153.
- 11. Instituto Nacional de Estadísticas. Guatemala, Encuesta de salud materno infantil 1998-1999, Guatemala. *Macro International Inc. USA*, Julio 1999;110-115.
- 12. Asociación Pro-Bienestar de la Familia Colombiana. Encuesta Nacional de Demografía y Salud 1995, Colombia. *Macro International Inc. USA*, Octubre 1995;113-119.
- 13. Centro de Estudios Sociales y Demográficos, CESDEM. Encuesta Demográfica y de Salud 1996. República Dominicana. *Macro International Inc. USA*, Junio 1997;139-146.
- Instituto Nacional de Estadística. Encuesta Nacional de Demografía y Salud 1998. República de Bolivia. *Macro International Inc.* USA, Diciembre de 1998; 149-155.
- 15. Pan American Health Organization/World Health Organization. Health Statistics from the Americas. 1998 Edition. *Washington, DC: OPS/OMS*, 1998;142-150.
- Mahalanabis D, Faruque AS, Islam A, Hoque SS. Maternal education and family income as determinants of severe disease following acute diarrhoea in children: a case control study. *J Biosoc Sci.* 1996;Apr;28(2):129-39.
- 17. Rubin DH, Leventhal JM, Krasilnikoff PA, Kuo HS, Jekel JF, Weile B, et al. Relationship between infant feeding and infectious illness: a prospective study of infants during the first year of life. *Pediatrics*. 1990;Apr;**85**(4):464-471.
- Forsyth JS, Ogston S, Clark A, Florey C du V, Howie PW. Relation between early introduction of solid food to infants and their weight and illnesses during the first two years of life. *Br Med J.* 1993;**306** (6892):1572-1575,.
- Valdes Roque AI, Martinez Canalejo H. Educational level of mothers and their knowledge, attitude and practices concerning respiratory infections of their children. Rev Panam Salud Publica. 1999;Dec;6(6):400-7.
- Muhe L. Mothers' perceptions of signs and symptoms of acute respiratory infections in their children and their assessment of severity in an urban community of Ethiopia. Ann Trop Paediatr. 1996;Jun;16(2):129-35.
- Pebley A, Hurtado E, Goldman N. Beliefs about children's illness. J Biosoc Sci. 1999;Apr;31(2):195-219.
- 22. Goldman N, Heuveline P. Health-seeking behaviour for child illness in Guatemala. *Trop Med Int Health*. 2000;Feb;**5**(2):145-55.
- 23. Heuveline P, Goldman N. A description of child illness and treatment behaviour in Guatemala. *Soc Sci Med.* 2000;Feb;**50**(3):345-64. Review.
- 24. Paganini, JM. Los sistemas locales de salud: una estrategia para favorecer la cobertura y la equidad en salud. En: "Acciones de salud maternoinfantil a nivel local: según las metas de la Cumbre Mundial en Favor de la Infancia". Washington, DC: OPS/OMS,1996;19-25.
- Rowe AK, Onikpo F, Lama M, Cokou F, Deming MS. Management of childhood illness at health facilities in Benin: problems and their causes. *Am J Public Health.* 2001;Oct;**91**(10):1625-35.
- 26. de Quadros CCA, Olivé JM, Nogueira C, Carrasco P, Silveira C. Programa ampliado de inmunización. En: "Acciones de salud maternoinfantil a nivel local: según las metas de la Cumbre Mundial en Favor de la Infancia". *Washington, DC: OPS/OMS*, 1996;143-172.
- 27. Suárea Ojeda, EN, Desarrollo integral del niño. En: "Acciones de salud maternoinfantil a nivel local: según las metas de la Cumbre Mundial en Favor de la Infancia". *Washington, DC: OPS/OMS*, 1996;57-74.
- 28. Valenzuela C. Control de las enfermedades diarreicas (CED). En: "Acciones de salud maternoinfantil a nivel local: según las metas de la Cumbre Mundial en Favor de la Infancia". *Washington, DC: OPS/OMS*, 1996;77-102.

- 29. Benguigui Y. Control de las infecciones respiratorias agudas (IRA). En: "Acciones de salud maternoinfantil a nivel local: según las metas de la Cumbre Mundial en Favor de la Infancia". *Washington, DC: OPS/OMS*, 1996;105-140.
- 30. Gupta S. Delivery of child health care at the peripheral level. *Indian Pediatr.* 1976;Oct;**13**(10):739-40.
- Wolfheim C. From disease control to child health and development. World Health Forum. 1998;19(2):174-81.
- 32. Biswas AB, Mitra NK, Nandy S, Sinha RN, Kumar S. Missed opportunities for immunisation in children. *Indian J Public Health*. 2000;Jan-Mar;**44**(1):23-7.
- 33. Szilagyi PG, Rodewald LE. Missed opportunities for immunizations: a review of the evidence. *J Public Health Manag Pract.* 1996;Winter;**2**(1):18-25. Review.
- Hutchins SS, Jansen HA, Robertson SE, Evans P, Kim-Farley RJ. Studies of missed opportunities for immunization in developing and industrialized countries. *Bull World Health Organ.* 1993;**71**(5):549-60.
- 35. World Health Organization. Handbook IMCI. WHO/FCH/CAH/00.12. WHO, 2000.
- World Health Organization. Model chapter for textbooks IMCI. WHO/FCH/CAH/ 01.01. WHO, 2001.
- Organizción Panamericana de la Salud/Organización Mundial de la Salud. AIEPI. Guía de adaptación. OPS/HCP/HCT/ARI-CDD/96.37. Washington, DC, 1996.
- Organización Panamericana de la Salud/Organización Mundial de la Salud. El proceso de adaptación del curso clínico AIEPI: recomendaciones para los países de la Región de las Américas. OPS/HCP/HCT/AIEPI/97.22. Washington, DC, 1997.
- 39. World Development Report 1993. Investing in Health. Oxford University Press, 1993;108-133.
- 40. Byrnes JJ. Do integrated healthcare strategies enhance quality? *Integr Health Rep.* 1998;Jul:6-10.
- 41. Herman E, Black RE, Wahba S, Khallaf N. Developing strategies to encourage appropriate care-seeking for children with acute respiratory infections: an example from Egypt. *Int J Health Plann Manag.* 1994;JI-Sep;**9**(3):235-43.
- Harrison D, Barron P, Glass B, Sonday S, vd Heyde Y. Far fewer missed opportunities for immunisation in an integrated child health service. S Afr Med J. 1993;Aug;83(8):575-6.
- 43. Ortiz, JL, Chumacero, LI, Dávila, M. AIEPI y el uso de antibióticos. Noticias sobre AIEPI, Número 3, Mayo 2000. *Washington DC*, 2000;6-7.
- 44. Narváez, T, Cuevas, K, Ganchozo, JP. Programa de atención primaria de salud. Noticias sobre AIEPI, Número 4, Diciembre 2000. *Washington, DC*, 2000;7-9.
- 45. Organización Panamericana de la Salud/Organización Mundial de la Salud. Lanzamiento de la iniciativa Niños sanos: la meta de 2002. Serie HCT/AIEPI 33.E. Washington, DC, 2000.
- 46. Organización Panamericana de la Salud/Organización Mundial de la Salud. Foro regional sobre el control del asma en el contexto de AIEPI. Serie HCT/ AIEPI-35.E. Washington, DC: OPS/OMS, 2000.
- Organización Panamericana de la Salud/Organización Mundial de la Salud. La Salud en las Américas. Publicación Científica No. 569. Washington, DC: OPS/OMS, 1998;68-70.
- 48. Pan American Health Organization/World Health Organization. Health Statistics from the Americas. 1998 Edition. *Washington, DC: OPS/OMS*, 1998;41-52.
- Organización Panamericana de la Salud/Organización Mundial de la Salud. La Salud en las Américas. Publicación Científica No. 569. Washington, DC: OPS/ OMS, 1998;70-71.
- 50. Pan American Health Organization/World Health Organization. Health Statistics from the Americas. 1998 Edition. *Washington, DC: OPS/OMS*, 1998;53-60.

- World Health Organization. A critical link. Interventions for physical growth and psychological development. A review. WHO/CHS/CAH/99.3. WHO, 1999.
 Organización Panamericana de la Salud/Organización Mundial de la Salud. Grupo asesor técnico AIEPI (GATA). Informe de la primera reunión. Serie HCT/ AIEPI-66.E. Washington, DC: OPS/OMS, 2001.

A RANDOMIZED TRIAL FOR THE EVALUATION OF A NEW MODEL OF ROUTINE CHILD HEALTH CARE IN OUAGADOUGOU, BURKINA FASO: THE EFFECTS OF CHANGING PRACTICES AND ATTITUDES OF THE HEALTH STAFF

Isabelle Francois¹, René Tonglet¹, Henri Compaore², Honoré Daoudongar Djimrassengar², Sabine Kima², Etienne Kabore², Michèle Dramaix¹, Philippe Hennart¹

Introduction

Child health and growth in developing countries has always been a challenging issue for public health managers. Growth monitoring (GM), promoted since the seventies as one of the key technologies for improving child's health (1,2), is an intrinsic part of routine child care in many parts of the world. However, an ongoing controversy casts doubts on its effectiveness on the growth promotion of the young child (3-13).

There is also a lack of evidence on how the organization, content, frequency and timing of visits in a traditional well-baby clinic could be optimized. The content of the proposed services are often delivered as standardized packages on a predetermined scheduling pattern, leaving little initiative, responsibility and thus self-satisfaction to nurses. Moreover it weakens seriously the potential for adapting services to the needs of each individual child. Despite the well-documented advantages of the currently advocated patient-centred health care provision (14-16) and the fact that mother's views are recognized as good predictive indicators (17,18) for child health, often little attention is paid to the views and demands of the children's mothers.

Lastly, the continuity of the caregiver and the integration of care is not facilitated by the traditional organization of well-baby clinics, where services are usually handled by different health staff in successive places.

¹ Epidemiology Unit (UCL 30.34), School of Public Health, Faculty of Medicine, Catholic University of Brussels, Brussels, Belgium

² Centre Médical Paul VI, Ouagadougou, Burkina faso

During the last decade, the question of alternative strategies for promoting child growth started to raise international interest and advocacy was made for research on that topic (19). In 1995 a new strategy of care for the sick child was launched by WHO as, the Integrated Management of the Sick Child (20).

In this background, it appeared interesting to us to launch a research with the aim of evaluating the potential benefit of a new model of routine childcare on health and growth of the young child as compared to the standard strategy of care. This paper presents the results of a randomized-controlled trial conducted with this aim. We proposed an interactive model of care built around three major concepts:

- The reinforcement of the nurse's autonomy in the decision making process;
- The importance given to the mother's interview;
- The integration of care in time, place and person.

The research hypothesis was that this interactive model would improve the effectiveness of child care during the first year of life and lead to better health outcomes, by fitting more appropriately the children's needs, increasing the concern and self-esteem of nurses and by enhancing the confidence of the mothers.

Subjects and methods

Settings

The study took place in the under-five clinic (U5C) of the Medical Centre Paul VI (MCP6), in Ouagadougou, Burkina Faso in Western Africa. This centre is one of the four district reference centres of the city and its U5C registered 2,139 new admissions in 1996, which represented 12% of all under-five new admissions of the city. The research project was nested within a technical support project to the district. Preliminary studies aimed at describing and assessing the functioning and performances of the U5C. With the collected information two conceptual strategies of providing care to the young child were proposed to be tested in a randomized clinical trial set-up.

Ethical approval

Study design and methods were approved by the ethical committee of the Catholic University of Louvain and by the health authorities in Burkina Faso.

Description of interventions

In the reference group (R), the strategy of childcare proposed, did not differ from the currently followed national strategy, except that efforts were made to improve its quality of care. It consisted of monthly weighting sessions with growth chart monitoring, and a standardized package of activities, which consisted of:

- A general interview;
- A specific interview on feeding practices;
- A general clinical examination;
- A specific clinical examination to search signs of malnutrition.

In case illness was suspected, the child was referred to the curative consultation, which was handled by another nurse. Vaccinations, wound dressing & injections were also performed in different places by different staff and with a waiting period in between each station.

The strategy of care proposed to the intervention group (I) was an interactive model of care. One nurse was in charge of all aspects of the consultation in one and the same place, from monitoring the children's well being to curative care. The consultation started with two open questions to the mother on how she perceived her child's health and her child's growth. Based on the information collected during the interview, the nurse was free to choose which other diagnostic activities to perform, in order to assess properly the child's health and growth. At the end, the nurse had to classify the child's health in three different classes:

- A child without a health problem;
- The presence of (an) important risk factor(s)
- A sick child whose health problem has to be tackled immediately.

Based on this assessment, the nurse was also free to determine the date of the next appointment.

Some guidelines or recommendations were common to both strategies, such as:

- The use of standardized treatment algorithms in case of illness;
- The respect of a decisional tree in case of growth faltering (using height for weight and mid-upper arm circumference MUAC-);
- A close follow-up of any child at risk.

Implementation of the trial

The consultations at the U5C were reorganized in two different circuits, each one corresponding to a specific strategy. Mothers arriving at the clinic waited in a common waiting room, where a common session of information was organized for newcomers about the conduct of the trial and the randomization process. This was followed by health education messages. Afterwards, staff and activities were separated, except for the EPI activities, which were common to both groups for logistical constraints. Redistribution of health staff between the two strategies was done on a voluntary base: 2 nurses to the I group (running two consultations in parallel) and 3 nurses to the R group (one for the curative station and 2 in parallel for the weighting). The nurses were trained according to the specificity of their circuit. The head nurse and the medical doctor of the U5C assumed daily close supervision and quality control. Overall co-ordination and supervision was done from Brussels.

Study population & randomization

The study population consisted of all newly registered children at the U5C, from August 97 to March 98. Block randomization at entry was done by groups of 10. Each randomized child was followed-up to the age of 12 months.

Data collection and outcomes measures

Measures of weight and recumbent height were performed on admission and at the age of 6 and 12 months. Data were collected about the child's health status at each visit (i.e. anthropometry when performed, type of morbidity if sickness) and some operational aspects of the consultation (a.o. date of visit, person(s) in charge, diagnostic activities performed, date of next appointment). Additional data collection in the I strategy, included the mothers' and the nurses' perception on the child's health and growth. A survey was organized after the study, aiming at tracing back all children that were lost to follow-up, in order to get the information about their vital status at the age of 12 months.

The study outcomes measured were morbidity, mortality and growth.

Data management and analysis

Data were entered on the microcomputers available on site and processed in Brussels, using the Epi-info software package and the SPSS 9.0 release for Windows. Simple descriptive and graphical methods were used for the preliminary statistical analysis of univariate data. Standard statistical methods were used for bivariate analysis. Multivariate analysis was performed using the linear regression, logistic regression and Cox survival analysis.

Timing

After a one month of piloting, the study was launched in August 1997. Enrolment at the U5C continued for 8 months. The data collection ended in March 1999. Database was ready for analysis on February 2001.

Results

Randomization

1,161 children were enrolled in the study during the recruitment period. 582 children were randomly allocated to the reference group and 579 to the intervention group. The groups were similar regarding age, nutritional status, birth history and socio-economic environment (Table 1).

Table 1: Characteristics of the two study groups

	Reference Group (n=582)	Intervention group (n=579)
Mean Age on admission (SD)	2.05 (1.15)	1.99 (1.09)
Sex Ratio (F/M)	0.97	0.99
Illiterate mother (%)	63.4	60.7
Illiterate father (%)	49.1	50.6
Age of the mother (SD)	25.3 (5.8)	25.3 (5.8)
Marital status of the father (%)		
Polygamous	83.4	80.9
Monogamous	16.6	19.1
Number of children in the household who died before the age of 5 years (%)		
	76.2	77.6
0	16.6	17.2
1	7.3	5.2
>=2		
Number of brothers or sisters (%)		
0	34.2	37.1
	50.9	43.0
1-3	14.9	19.9
>=4		
Nutritional status on admission (SD)	0.10(1.08)	0.15 (1.06)
Mean weight for age Z-score	-0.10 (1.08)	-0.15 (1.06)
Mean meight for beight 7 acore	-0.28 (1.13)	-0.38 (1.18)
Prevalence of westing (WHZ < 2 SD)	-0.09 (0.90)	-0.10 (0.90)
Prevalence of structure ($HAZ < 2SD$)	6.0%	6 5%
Place of birth $(\%)$	0.970	0.070
- Home	29	3.1
- Maternity of CMP6	71.0	64.9
- Other place	26.1	32.0
Prematurity (%)	1.2	1.4
Mean birth weight in kg (SD)	2.94 (0.45)	2.89 (0.44)
Mean height at birth in cm (SD)	48.5 (2.7)	48.7 (2.3)

Follow-up completion

Mean length of follow-up was 7.8+-3.7 months in the R group and 8.2+-3.5 months in the I group (I) (p=0.56). The total observation time amounted respectively to 4,565 and 4,733 childmonths. 69% of the randomized children in both groups underwent the nutritional assessment foreseen at 6+-1 months. 49% and 51% of the I and R children respectively underwent the nutritional assessment foreseen at 12+-1 months. Information on vital status at the age of 12 months could be gathered for 463 (79.6%) children in the R group and 460 (79.4%) in the I group. The reasons for ending the study are presented in table 2.

N(%)	Total N=1161	Reference group N=582	Intervention group N=579
End of study (*)	647 (55.7)	326 (56.0)	321 (55.4)
Death	37 (3.2)	23 (4.0)	14 (2.4)
Change of address/transfer of U5C	107 (9.2)	49 (8.4)	58 (10.0)
Abandon	247 (21.3)	126 (21.6)	121 (20.9)
Unknown	123 (10.6)	58 (10.0)	65 (11.2)

Table 2: Reasons for exit the study

^(*) being defined as "attended the UC5 during the 12th – 14th month age period". Children who were last seen before their birth birthday but had underwent a final nutritional assessment after their eleventh month were considered as well as "end of study".

Process of care or application of interventions

During the study period, a total of 11,180 consultations were performed (5,899 R- 5,281 I). The reasons for consultations were distributed similarly in both groups: routine control visit (76%), illness episode (11%), control visit after illness episode (10%) and others (2 %).

In the R group, 12% of the children attending the weighing session have been referred to the curative consultation, while one third of all encountered morbidity episodes (new or old cases) have directly been handled at the weighing post. During the follow-up period, the mothers of the I group met a significantly lower number of different interlocutors than their counterparts of the R group (respective median values of 2 and 4, p=0.000, Mann-Whitney).

The content of the monitoring consultation differed between groups, in terms of type and frequency of diagnostic activities performed. We calculated the difference (d) between the expected number of activities to be performed during a child's follow-up if the standard package and the observed number of activities really performed. As expected, a very different R and I pattern was observed. For the R consultations, weighing and use of the growth chart have been key routine components. Similarly, the conduct of an interview -general or nutritional -, and a clinical examination general or focusing on signs of malnutrition- were routinely done in the reference group (median d = 0 for all these activities. On the opposite, the I consultation appeared much less homogeneous and standardized. The weighing (median d=1) and use of growth chart (median d=2) stayed the most used diagnostic activities but were not systematically performed. The interview on feeding (median d=2.0), the general clinical examination (median d=5) and search for clinical signs of malnutrition (median d= 6) were activities quite often discarded in a routine visit. The only activity which has been routinely performed was a general interview (median d=0), as requested in the study protocol. The measurement of the height, and the computation of weight for height indices, were activities that had been proposed as "second step" diagnostic tools in an algorithm common to both strategies. They were equally used in both groups (median d = 5).

The scheduling of the monitoring consultations was on average less frequent in the I group. Mean planned delays (+-SD) between two consultations of growth monitoring (not including those when the child was diagnosed sick) were 4.4 +-1.6 weeks in the I group versus 3.7 +-0.9 weeks in the R group (p=0.000 t-test). Analysis over time shows that the initial pattern of follow-up was similar in both groups and that the discrepancies appeared only at the 4th visit, which corresponds to the end of the immunization calendar (indeed, at that time, 72% of the children in both groups have already been vaccinated). Mean planned delays for the 3 first visits pooled together were 4.1+-1.6 weeks in the R groups and 4.4 +-3.2 weeks in the I group (p=0.161, M-W). Mean planned delays for the second set of the 4th till the 6th visit were 3.6+1.1 weeks in the R groups and 4.3 +-1.5 weeks in the I group (p=0.000, MW), while for the next 7th till 9th visits they were 3.3+-1.4 weeks in the R groups versus 4.6 +-2.1 weeks in the I group (p=0.000, M-W). From the 10th visit on, they were 3.3+-1.2 weeks in the R groups and 4.8 +-2.0 weeks in the I group (p=0.000, M-W).

In the I group, the number of monitoring consultations for the child who was aged less than 3 months old at entry and attended the 12th month visit, was significantly lower than in the R group (median of 8 versus 10, p=0.000).

The compliance of the mothers to the given appointment was not different between groups: 62% of all R consultations and 60% of all I consultations happened at the date of appointment +-1week (p=0,12).

In total, 730 (62.9%) children of the 1,161 children entered in the study have been fully immunized before their first birthday. The immunization coverage among children who completed the follow-up was 91.1% in the R group and 87.9% in the I group (p=0.18).

Weaning happened slightly earlier in the R group than in the I group (respectively at the mean age of 5.6 (1SD) months and 5.9 (0.6 SD) months p=0.000).

Clinical outcomes

Morbidity

Spontaneous consultations for a new illness episode were equally frequent in both groups (medians of 9.8 consultation per 100 child-months). There was no difference neither concerning the frequency of follow-up visits for one morbidity episode (median for both groups of 0.0 consultations per 100 child-months). The morbidity profile appeared similar in both groups. The detection rate of a new illness episode was identical in the R and I group with a median of 28.0 new episodes per 100 child-months.

Growth

We have observed that the weight growth pattern did not differ between groups but that the height growth did. The height growth velocity was significantly higher in the I group, with a difference of 0.2 cm/month during the period running from admission up to the age of 6+-1 months (p=0.000) and a difference of 0.05 cm/month (p=0.035) during the period running from admission up to the age of 12+-1 months. (Table 3). The multiple regression model did not highlight any confounding effect nor provided any gain of precision in assessing the effect of the allocation group on the height growth velocity.

	6+-1 months old		12+-1 months old			
	Reference	Interven-		Reference	Interven-	
	Group	Group		Group	Group	
Nutritional status		uroup			uroup	
Mean WAZ (SD)	-0.72	-0.72		-1.66	-1.80	
	(1.03)	(1.06)		(1.10)	(1.05)	
Mean WHZ (SD)	-0.34	-0.53	< 0.005	-1.06	-1.23	0.061
. ,	(0.98)	(1.07)		(1.00)	(1.01)	
Mean HAZ (SD)	-0.63	-0.41	< 0.05	-1.07	-1.07	
	(0.93)	(1.13)		(0.99)	(1.13)	
	Growth from admission		Growth from admission			
	up to 6+1 months old up to 12+1 mont		+ 1 month	s old		
Growth			P value			P value
			(T-test)			(T-test)
	n=436	N=431		N=269	N=270	
Mean wt gain, kg	2.04	2.14	0.156	3.28 (1.38)	3.31	0.773
(SD)	(1.14)	(1.03)			(1.16)	
Mean wt /age	-0.63	-0.60	0.595	-1.69	-1.72	0.656
gain, z-score (SD)	(0.88)	(0.88)		(1.06)	(1.00)	
Mean wt growth	0.48	0.51	0.056	0.32 (0.12)	0.32	0.957
velocity, kg/month	(0.22)	(0.22)			(0.10)	
(5D)	n-225	N-227		N-202	N-205	
Maan lat main and	0.51	10.05	0.000	15.90	16.64	0.010
(SD)	9.51	10.25	0.008	15.89	(2,50)	0.018
(SD) Moon ht/org	0.21	(3.04)	0.001	(3.83)	0.75	0.064
gain 7-score (SD)	-0.31	(1 12)	0.001	-0.90	(0.93)	0.004
Mean ht growth	2.17	2.38	0.000	1 55 (0 20)	1.60	0.035
velocity	(0.62)	(0.88)	0.000	1.00 (0.29)	(0.27)	0.000
cm/month (SD)	(0.02)	(0.00)			(0.21)	

Table 3: Comparative growth in the two study groups from admission up to the age of 6+- 1 months and from admission up to the age of 12+-1 months.

Mortality

14 (2.0%) children of the I group died before their first birthday against 23 (4%) for the R group, representing a relative risk in terms of incidence density of 0.59 (95%CI 0.30-1.15).

Bivariate analysis showed a significant association between three characteristics of the children at entry and the higher occurrence of death, i.e.:

- An age higher than 2 months at entry (p=0.0005);
- Birth outside of maternity of MCP6 (p=0.038);
- The history of 2 or more children in the household who died before the age of 5 years (p=0.009).

Sex, birth history, nutritional status on admission and others indicators of family status (i.e. parents literacy level, parents age, marital status of the father) were not associated with death. The Cox proportional hazards model considered four independent variables: the three factors revealed by the bivariate analysis and the allocation group. The adjusted hazard ratio (HR) for the intervention group versus the reference group was 0.56 (0.28-1.10; p = 0.092).

Children aged 2 months or less at entry appeared to be less at risk than those older than 2 months (HR 0.31 (0.16-0.63); p=0.001). Children born at the maternity of MCP6 survived better than those born outside (HR 0.45 (0.23-0.87); p=0.018). Living in a household where not more than one child had died before the age of 5 years was also a protective factor (HR 0.36 (0.15-0.87); p=0.023). Adjusted survival curves in the two allocation groups are presented in figure 1.

Figure 1: Survival curves



Discussion of the results

Limitations of the study

The study design and the use of multivariate modelling techniques make us feel confident that the study results have not been confounded. Concerning the possibility of bias, the two groups did not differ in regards to he reliability and completeness of data collection in both groups, the quality of anthropometric measurements nor the competence of health staff in charge in following diagnostic and treatment algorithms. This, together with a sustained supervision and regular training in both groups, make us confident about the fact that there was no reporting bias and that the technical competence of nurses in both groups was similar. We did neither observe that the voluntary-based assignment of nurses to an intervention group led to different motivation, nor that the two groups differed in regard to the natural charisma and popularity of the nurses. Two of the 3 nurses in the R group had to be replaced during the study period because of external constraints, while the two nurses in charge of the intervention group have been maintained. This turnover certainly accounts by itself for the observed difference in the number of interlocutors met by the R and I mothers during their child's follow-up. We can not exclude that this turnover might also have affected the quality of work, but as training and supervision has been continued, we think it did only transitorily and minimally affect the other study results.

There was a similar proportion of lost of follow-up cases, in each study cohort. The proportions of abandon, transfer, change of houses or unknown were also similar in both groups. No difference in the length of follow-up was noted. The overall proportion of lost to follow-up might appear high but it should be reminded that the study was run in a routine setting, where attendance rate drops after the immunization period, and that we did not make any effort to obtain the highest level of follow-up completion because attendance was considered as an interesting study outcome. We could obtain a valid information on the vital status at the age of 12 months for 79% of the children in both groups. We do not have any reason to think that the children lost for follow-up did differ between groups regarding their probability of having died before age 12. They might, as a group, have been exposed to a higher mortality rate. We are aware that the difference in survival between groups is borderline significant and that we have a 9% probability that it occurred purely by chance. Therefore, this potential impact on child survival is to be considered with caution, although it seemed likely in regards to the concomitant and highly significant impact on height growth and the well documented link between stunting and mortality (21-23).

Clinical outcomes

Our findings support the research hypothesis. Although the child followed in the intervention arm was as likely to be diagnosed sick and was gaining weight at the same rate, he enjoyed better survival and better height growth. Concerning the observed difference in height growth between the two study groups, this impact raises great potential interest for public managers, as stunting is a challenging issue for the coming years and many questions remain concerning its determinants and vulnerability. In our study, it is interesting to note that the better height growth is limited to the first six months of age period and that it is still visible, although attenuated, at 12 months of age. It could be linked to a higher vulnerability of the young child to this type of intervention because growth velocities are higher at earlier ages. We think that further data analysis and research are needed to highlight this growth dynamic and the underlying mechanism.

Process of care

The observed I and R pattern of using diagnostic activities and scheduling monitoring visits can be described as an "opportunistic" approach versus a "normative" one. The I nurse obviously adapted behaviour to each case, as taught. We report that the I nurses felt a greater feeling of self-esteem, sense of responsibility and professionalism on various debriefing and assessment sessions. This was proudly summarized by one of them, who told us: "The new strategy makes me feel responsible for the child."

The fact that the I mother was given that central role in the consultation could have enhanced a better communication pattern and an increased confidence. However, if so, we did not see any impact on the compliance of the mother to the rendezvous given and the number of abandoned or lost to follow-up was the same. We did not notice neither an increased number of spontaneous consultations for a sick child, which could have witnessed an impact on the health seeking behaviour.

Finally, we report also here the valuable observation that health staff of the U5 clinic spontaneously and enthusiastically adopted the interactive model after the RCT, without waiting for the results of the trial. For them, this model was obviously more satisfying.

Conclusion

Although it certainly has its limitations, we think that this RCT can bring objective and valuable insight to the current problematic of promoting child growth and health in developing countries. Probably the reinforcement of the nurse's autonomy in the decision making process and the importance given to the mother's interview in the proposed interactive model of care seems to have had most influence on children's growth & survival.

In how far this is based on a more responsible & professional follow-up of the children or due to an improved psychosocial environment created or by a combination of both factors can not be demonstrated here. The observed effects on the children's well being and the voluntary adoption of the interactive model of care by the CMP6 should, however, trigger further interest from researchers and public health managers.

Acknowledgements

For the implementation of this RCT, we would like to thank the Health staff of the CMP6 and all the patients who have been enrolled.

Funding: Convention de recherche du Fonds National de la Recherche Scientifique Médicale, Belgique, n° 3.4510.96). Fonds spéciaux de recherche de l'Université Catholique de Louvain-Conflict of interest: none

References

- 1. Morley DC and Woodland M. See how they grow. London: Macmillan, 1979.
- 2. A growth chart for International Use in maternal and child care: guidelines for primary health care personnel. *Geneva: WHO*, 1978.
- 3. Gopalan C and Chatterjee M. Use of growth charts for promoting child nutrition: a review of global experience (special publication series). *New Delhi: Nutrition Foundation of India*, 1985.
- 4. Editorial. Growth monitoring: intermediate technology or expensive luxury? Lancet. 1985;**ii**:1337-1338.
- 5. Van Lerberghe W. Child mortality and growth in a small african town. A longitudinal study of 6628 children from Kasongo (Zaire). Dissertation. *Universiteit Antwerpen*, 1987.
- 6. Nabarro D, Chinnock P. Growth monitoring inappropriate promotion of an appropriate technology. *Soc Sci Med.* 1988;**26**(9):941-948.
- 7. Morley D, Proctor J. Making growth visible in the community. *Indian J Pediatr.* 1988;**55**(suppl):38-43.
- 8. Hendratta L, Rhode JE. Ten pitfalls of growth monitoring and promotion. *Indian J Pediatr*. 1988;**55**(suppl):9-15.

- 9. Briend A, Bari A. Critical assessment of the use of growth monitoring for identifying high risk children in primary health care programmes. *Br Med J.* 1989;**298**:607-11.
- 10. Dixon RA. Monitoring the growth of the world's children. Ann Trop Paediatr. 1991;**1**:3-9.
- 11. Gerein NM, Ross DA. Is growth monitoring worthwhile? An evaluation of its use in three child health programmes in Zaire. *Soc Sci Med.* 1991;**32**(6):667-75.
- George SM, Latham MC, Abel R, Ethirajan N, Frongillo EA Jr. Evaluation of effectiveness of good growth monitoring in South Indian villages. *Lancet.* 1993; 342:348-352.
- Garner P, Panpanich R, Logan S. Is routine growth monitoring effective? A systematic review of trials. Arch Dis Child. 2000;82:197-201.
- Hart JT. What does patient-centredness really mean? Br J Gen Pract. 2001(Nov); 51(472):934-5.
- Little P, Everitt H, Williamson I, Warner G, Moore M, Gould C, Ferrier K, Payne S. Observational study of effect of patient centredness and positive approach on outcomes of general practice consultations. *BMJ*. 2001(Oct 20);**323**(7318):908-11.
- Lewin SA, Skea ZC, Entwistle V, Zwarenstein M, Dick J. Interventions for providers to promote a patient-centred approach in clinical consultations (Cochrane Review). *Cochrane Database Syst Rev.* 2001;**4**:CD003267.
- 17. Tonglet R Surveillance de la croissance et prévention de la morbidité du jeune enfant en milieu rural africain: éléments d'évaluation épidémiologique [PhD dissertation]. Université Libre de Bruxelles, Faculté de Médecine, Bruxelles, 1994.
- Tonglet R, Mahangaiko Lembo E, Mweze Zihindula P, Wodon A, Dramaix M, Hennart Ph. How useful are anthropometric, clinical and dietary measurements of nutritional status as predictors of morbidity of young children in central Africa? *Trop Med Int Health.* 1999;**4**:120-130.
- Cervinskas J, Gerein N & Sabu George M (Eds.). Growth promotion for child development. Proceedings of a colloquium held in Nyeri, Kenya, 12-13 May 1992. Ottawa: International Development Research Centre, 1993.
- 20. World Health Organization. Integrated management of the sick child. Bull World Health Organ. 1995;**73**:735-740.
- 21. Waterlow JC (Ed). Linear growth in less developed countries. Nestlé Nutrition Workshop Series, Vol. 14. *New York: Raven Press*, 1988.
- 22. Chen LC, Chowdhury A, Huffman SL. Anthropometric assessment of energyprotein malnutrition and subsequent risk of mortality among preschool age children. *Am J Clin Nutr.* 1980;**33**:1836-1845.
- 23. Shrimpton R, Victoria CG, de Onis M, Lima RC, Blossner M, Clugs G. Worlwide timing of growth faltering: implications for nutritional interventions. *Pediatrics*. 2001;**107**(5).

DEVELOPMENT AND TESTING OF AN INTERVENTION STRATEGY FOR IMPROVING PARTICIPATION OF PARENTS IN PROMOTION OF GROWTH AND DEVELOPMENT OF PRE-SCHOOL CHILDREN IN BOLIVIA

Edgar Sejas¹, Tom Hoeree², Daniel Illanes¹, Caroline Mejean³, Bernard Maire³, Edgar Arduz¹,

Introduction

Earlier studies indicated a limited participation of the parents of pre-school children in the growth monitoring and health promotion programme (GMP) of the Ministry of Health of Cochabamba province - Bolivia. A lack of communication skills and tools for the health personnel were believed to be - at least partially - responsible for this. The objective of this study was to design and test an intervention strategy for improving communication between both caregivers and caretakers.

The results of a first series of studies using focus groups and individual interviews (reported elsewhere) made clear that parents were demanding for more information and explanations on their children's health status from the health personnel. But that on the other hand, health personnel did not consider this part of the health promotion activities as a priority within their task description. Therefore, a manual - in the form of a booklet - was developed explaining in clear and simple messages how to take care of the basic health needs of pre-school children. This manual covered dietary advice, developmental milestones and growth patterns of children and the different points of attention of a comprehensive preventive paediatric consultation. During a two-day training workshop, the manual was introduced as a communication and education tool for all health personnel. The essentials of growth and development of children were refreshed and communication skills were exercised. The manual was then distributed to all mothers attending curative and preventive services.

¹ Department of Sociology, University Mayor of San Simon, Cochabamba, Bolivia.

² Nutrition and Child Health Unit, Institute of Tropical Medicine, Antwerp, Belgium.

³ Institut de Recherche pour le Développement, Montpellier, France.

Methods

The intervention, as described above, was tested in Cochabamba province - Bolivia - in an urban and rural health centre, with an estimated population of responsibility of respectively 36.000 and 15.000.

During the process of implementation two group discussions were held with the health personnel of each health centre. These focussed on problems encountered during implementation and their perceptions of the usefulness of the manual and its acceptance by mothers consulting.

After 2,5 months of implementation an external researcher conducted interviews with individual mothers exiting the consultation room. Questions related to their number of and satisfaction with the explanations given by the health staff on the health status of their child. Between April and July 2001, 65 interviews were conducted. 17 were conducted in the urban health centre and 16 in the rural centre where the manual was introduced. And respectively, 18 and 14 interviews were conducted at nonintervention sites. All interviews were tape recorded and transcribed and answers were encoded and analyzed using QSR Nudist software.

Results

The group discussions indicated that the manual and the training responded to a felt need of the health personnel. Their confidence had grown in addressing the subject of health promotion with the mothers. They also felt that mothers did respond much more eagerly to their explanations than they did in the past (see Table 1). Finally, the manual seemed to provide the mothers with an opportunity - which did not exist in the past - to consult specifically for their worries on the diet of their children.

Table 1: Most frequently mentioned benefits of the manual by health personnel

Health personnel declared, that

- they had more confidence in addressing health promotion issues with mothers
- mothers responded positively to their explanations and advice
- some mothers even consulted specifically for advice
- the manual responded to their and caretakers information needs
- they provided more systematically health education

The analysis of the exit interviews with the mothers shows that advice is now more frequently given during consultations. Mothers also indicated to be very satisfied with the explanations given with the help of the manual. In table 2, frequency of advice given per consultation are presented.

Table 2: Percentage of mothers indicating having receivedadvice on specified topics during precedingconsultation

Advice received on:	Urban	Urban	Rural	Rural
	without	with	without	with
	manual	manual	manual	manual
Timing of complementary food	67 %	100 %	64 %	100 %
Preparation of complementary food	67 %	94 %	21 %	93 %
Frequency of meals per day	56%	94 %	21%	67 %
Language and motor development	46 %	53 %	10 %	52 %

Discussion & conclusions

Although, these results are very encouraging, they should be interpreted with caution. Increased provision of information could have been the sole result of the recent training and not of the manual per se. However, health workers did indicate that the manual was a support during their routine activities. Also for the parents the manual was felt to have an additional value. They in particular felt, that the manual gave them more self-confidence to discuss growth and development of their children with the health staff. So, the manual seemed to motivate the health workers to provide and the parents to use, improved promotional services. So, these results seem to indicate a marked improvement in the communication between caregivers and caretakers.

Further evaluation needs to be done in order to understand the long-term effects of this new intervention strategy on communicative behaviour of the health personnel, as well as, on whether the provided information was assimilated and has introduced changes in child rearing practices of the caretakers.

IMPROVING NUTRITION SITUATION WITHOUT SUPPLEMENTARY FEEDING: EXPERIENCE FROM SC-UK PROJECTS IN BANGLADESH

Moazzem Hossain¹, Abdullah-Al-Harun¹, Anna Taylor¹

Introduction

Despite impressive gains, malnutrition till to date remains as one of the biggest Public Health Problems in many low-income countries including Bangladesh. Currently 51 percent children in Bangladesh are underweight (low weight for age), 49 percent stunted (short for age) and 12 percent wasted (low weight for height). 45 percent of the babies are born with low birth weight and only 13 percent children are exclusively breastfeed for complete 5 months. More than 45 percent of mothers have low BMI (<18.5). High rate of malnutrition not only negatively influences the physical growth, mental capacity, learning ability and productivity but is also one of the most important causes of deaths among children in Bangladesh. Many achievements are undermined by the current infant mortality rate of 57 per 1000 live births (1) and child mortality being 118 per 1000 1-4 years children (2).

The Bangladesh Integrated Project (BINP), initiated in 1996 in six thanas (lowest administrative unit) and covers over 12% of rural communities (60 thanas), is now one of the major large scale nutrition programmes among developing countries funded by the World Bank. The project is heading for another expansion as National Nutrition Project that will cover the whole country in 10 years time. BINP includes a broad range of activities but is more known for it's community based nutrition component which provides nutrition servicesgrowth monitoring, nutrition counselling and food supplementation for those found to be nutritionally at risk. It is directed primarily at children under the age of two and pregnant and lactating women. These service are offered at the community level through community nutrition promoters (CNP) supervised by Community Nutrition Organizers (CNO). Growth monitoring and supplementary feeding takes place at the Community Nutrition Centres (CNC), a space offered by any

¹ Save the Children, UK

village volunteer to carry out the activities during a certain part of the day.

Though appreciated by many people in the Bangladesh, SC-UK could not agree to the overemphasis of caring practices and undermines the economic opportunities in the project design, SC-UK had initiated a small pilot with the following objectives:

- Enhance the capacity of the mothers to manage and handle malnutrition at the household level using available resources in the community;
- Explore the feasibility of participatory approaches to ensure community ownership in nutrition activities;
- Look for an alternative to the supplementary feeding programme by external sources and try something within the opportunities of the household members.

Materials and methods

The study was conducted at Kotchandpur - a rural area of Bangladesh covering a population of 16520 (6048 households) during July 1998 to June 2000.

Intervention

Since the project aimed at enhancing community capacity and exploring the feasibility of participatory approaches, one of the main strategies of working was to identify self-help initiatives (SHIs) and work through them in the community. 13 such SHIs identified (one in each village) were identified to start as an entry points to those communities. Later the activities stretched to women groups also. A total of 10 Community Nutrition Workers (CNW) were recruited locally from the same villages where they had to work and were provided hands on trained by experts on nutrition and participatory methods. CNWs applied participatory methods like Participatory Discussions Rapid Appraisal (PRA), Focus Group (FGD), Participatory Planning Process (PPP) etc. methods to build a confident relationship with the community, identify problems, find possible solutions, make an action plan to materialize the proposed solutions to reduce the gap between the desired situation and the reality. As an outcome of the PPP, one of the activities identified by the community was to demand/receive training from the project on nutrition and health issues. The other major decision was conducting growth-monitoring a session once in every month for each village or in the area of the SHI. Growth monitoring sessions started in any of the volunteer's or influential people's house

(courtyard), eventually it merged with the EPI (Expanded Programme on Immunizations) session organized by the Public Health Service Provider (called Health Assistant or HA). At the initial stages of the project implementation, the CNWs used to inform the mothers of under 3 years old children and pregnant women a day before the day of happening of the event, later the volunteers played this role. However, once vaccinated, the children were weighted and recorded on a health card. From the weight chart the mothers could get an idea about their children's improvement of their health status (reflected in the weight chart). Nutrition counselling and cooking demonstration were also part of the growth monitoring sessions where the weighing, charting, nutrition counselling and cooking demonstration were done by the volunteers whereas the immunization and medical consultations were done by the HAs. No supplementary foods were provided, but mothers were taught how to prepare nutritious infant feeds at home using available resources around them. Those who could not attend the sessions or who were found to have a severely malnourished child were visited at home by the CNW. A thorough problem solving exercise was done with the household in order to find a workable solution and opportunities within the available resources. The pregnant mothers were advised about the importance of ante and postnatal care. In the later of the project activities, the CNWs encouraged the mothers to organize groups, make savings and receive credits or skill training in addition to their meeting and discussion on nutrition related issues.

Pre (baseline) & Post-intervention (evaluation) surveys

Pre (baseline) & Post-intervention (evaluation) surveys were done in 1998 and 2001 respectively. A total of 547 households were taken as sample during baseline while it was 563 during evaluation. Same households were interviewed twice but the number increased during evaluation due to the creation of new households by splitting the old ones. The samples were selected using systematic random sampling method by taking every eighth household. The anthropometric measurements were done with all the under five children available in those households. The number of under five children that was 222 in the baseline survey, it was 234 in the post intervention survey.

Data were collected administering a four parts interviewing schedule. The first part was used to identify respondents' demographic & economic characteristics of the household, food practice and toilet facilities. The second part was applied only to the mothers with under-five children. Third part was used to collect information on knowledge and practices about mothers' pregnancy status, delivery facilities, family planning and breastfeeding practices, immunization status, childhood diseases and nutritional status of the children. It also collected information on hand washing after defecation and mothers' knowledge about and practices during pregnancy period. The fourth and last part of the questionnaire addressed the questions regarding knowledge of the respondent about their benefit from the project, participation in growth monitoring and knowledge on some common nutrition issues.

The questionnaire was partly pre-coded and partly openended. After coding of the open-ended questions the data were entered in the computer using software based on 'Foxpro'. There were logical checks available in the software which did not accept any irrelevant data (like inconsistent, impossible or beyond range). Finally, the analysis was done using SPSS for Windows (version 9.0). For anthropometric analysis, EPI-Info (EPINUT) was also used.

Focus Group Discussions

Focus Group Discussions were conducted during and after the survey to get a better explanation of the quantitative data and also to understand the procedure of initiation, continuation and completion of the activities, process outcome and means of sustainability of the project activities both programmatically and financially.

Results

About 41 percent respondents were found illiterate during baseline survey, which reduced to 39 percent during post intervention survey. The proportion for non-formal education was 20 percent and 18 percent respectively. Approximately half of the respondents were found engaged in agriculture related works during both the surveys with a slight increase in the sharecroppers (26% to 28%). 21 percent of the respondents had owned some amount of agricultural land. About 26 percent respondents were the members of some co-operatives, savings groups or income generating activities during baseline survey that increased to 36 percent during evaluation.

Variables	Baseline	Post Intervention	p value
NGO, IGA membership	26.1	36.1	0.000
Homestead land holding			
No land	6.0	4.8	0.362
Up to 10 decimals	70.9	58.6	0.000
11-20 decimals	14.4	22.9	0.000
21+ decimals	8.6	13.6	0.007
Cultivable land holding			
No land	24.1	22.2	0.446
Up to 50 decimals	17.7	16.0	0.436
51-100 decimals	17.6	20.1	0.282
101-200 decimals	15.5	19.0	0.126
200+ decimals	25.0	22.7	0.366
Material of roof			
Concrete	5.9	8.0	0.158
Tin/CI sheet	46.9	68.1	0.000
Tally	28.9	26.6	0.376
Straw/leaf/Bamboo	32.4	22.3	0.000
Food cost			
Tk. 350-1000	22.9	11.2	0.000
Tk. 1001-2000	53.9	64.3	0.000
Tk. 2001-5000	23.0	24.2	0.659
Tk. 5001-10000	0.2	0.4	0.580
Education cost			
No cost	38.6	35.3	0.265
Tk 5-100	37.5	32.3	0.071
Tk. 101-500	17.4	24.5	0.003
Tk. 501-1000	3.5	3.6	0.943
Tk. 1000+	2.0	4.3	0.031
Households with TV	4.8	11.0	0.000
Ownership of			
Milking cows	19.2	24.9	0.022
Duck/hens	74.9	81.7	0.000

Table 1: Distribution of respondents according to their socioeconomic status

Ownership of land is one of the major determinants of socioeconomic status of households in rural Bangladesh. Only 6 percent respondents were found to have no homestead land during baseline survey that reduced to 4.8 percent during evaluation period. Proportion of households possessing at least 10 decimals of homestead land decreased from 71 percent during baseline to 59 percent after 2 years (p=0.000). Those having land between 11-20 decimals or more than 20 decimals increased significantly from baseline to evaluation (14% to 23%, p=0.000 & 9% to 14%, p=0.007 respectively) survey period indicating a better socio-economic status of community. There was also a positive trend in case of ownership of cultivable land but not so distinct like the homestead land and those are not statistically significant. There was an improvement found in using housing construction material also. Proportion of houses with straw/leaf/bamboo thatches have decreased (32.4% to 22.3%, p = 0.000) while the proportion increased in case of tin-shed (46.9% to 68.1%, p = 0.000) and concrete (5.9% to 8.0%, p = NS). Proportion of household with walls made of mud, brick and tin were 69, 24 and 1 percent respectively. The corresponding figures during evaluation were 67, 25 and 2 percent respectively. There have also been increases in proportion of households with television (5% to 11%, p=0.000), and cupboard (14% to 19%, p=0.01).

Information on household agricultural products was divided into two categories: one was rice or wheat and the other comprised of all other products. About 30 percent produced their subsistence for the whole year whereas 22 percent had it for six months. The proportions are similar both during baseline and evaluation surveys.

Questions were asked on the availability of domestic animals and their numbers. Ownership of milking cows and milking goats increased (19.2% to 24.9% and 10.6% to 14.4%) whereas ownership of cow/buffalo and goat/sheep decreased (55.4% to 49.9% and 47.3% to 43.7%). Ownership of duck and hens increased by more than 6 percent (74.9% to 81.7%) whereas, the ownership of pigeons has decreased a little (18.5% to 18.3%).

The mean and median expenditure on food was Taka 1710.52 and 1500.00 during baseline survey that was Taka 1793.90 and 1600.00 respectively during evaluation survey (p=0.000). Mean education cost per family per month increased from Taka 252 to Taka 308 (p=0.000) and the finding is very similar in case of conveyance also. Monthly expenditures on other items have also increased during evaluation than during baseline survey period.

Information on expenditures of some special items like treatment, clothing and social functions was calculated yearly. Proportion of households who spent Taka 1000-5000 for treatment and clothing purposes during baseline survey has now remarkably increased from 38 percent to 46 percent and from 72 percent to 83 percent respectively. Mean treatment cost per family per year increased from Taka 2843 to Taka 3664 (p=0.005).

The situation of exclusive breastfeeding practice rate deteriorated over time. The rate against zero months increased to 94 percent during evaluation that was 93 percent during baseline survey. Exclusive breastfeeding rate for both 2 and more than 2 months old children were 1.7 percent and 2.1 percent during post-intervention that was 1.4 and 1.8 percent respectively at the time of baseline survey (p=0.556).
The situation in terms of breast-feeding seems to have improved during evaluation. Only about 6 percent mothers were exclusively breast-feeding their babies that increased to about 16 percent during evaluation. Similarly the proportion of the households who were giving honey to the new-born as their first food also decreased from 69 to 51 percent (p=0.001). More than one fifth of the respondents stated that they left out some of the colostrum before giving it to the new-born. The situation has improved during evaluation (22% to 14%, p = .042). Prevalence of diarrhoea decreased by 5 percent (p=0.097) and ARI decreased by 10 percent (p=0.000) respectively.

The situation also improved in terms of mother's age of first childbirth. About 8 percent mothers during baseline survey had given the birth of their first child before 15 years of age but the proportion decreased to 3 percent during evaluation survey period (p=0.047). Other caring practices related to pregnancy also improved. At the time of base-line survey, only about 29 percent mothers could reduce their work load during pregnancy that during evaluation increased to 47 percent (p=0.015). Proportion of pregnant women who had been able to extra food during pregnancy was 21 percent during baseline that increased to 30 percent during evaluation (p=0.000). Major changes were also found in sanitation and hygiene practices. Proportion of respondents who had no fixed place for defecation had decreased from 51 percent to 31 percent while the percentage of hanging latrine remained the same (1.5 and 1.2 percent). On the other hand, fixed well or ditch for defecation rate increased from 35 percent from 54 percent (p=0.000) and sanitary latrine increased from 12 percent to 14 percent.

Daily dietary intakes of potatoes have increased from 56 percent households in base line survey to 88 percent (p=0.000) during evaluation. The proportion of milk intake has increased by 3 percent (22 vs. 25%, p=0.005), eggs by 3 percent (4 vs. 7 %, p=0.006) and ruti by 9 percent (4 vs. 13%, p=0.000) from base line to evaluation survey period.

Rates of malnutrition (less than -2 z score) have declined by 11 percent (43 vs. 32%, p=0.015) for stunting (height for age) and by 7 percent (45 vs. 52%, p= .01) for underweight (weight for age) in between the baseline and evaluation survey periods. Rate of wasting (weight for height) remained static around 14 percent during both the periods of surveys.

Variables	Baseline	Post Intervention	p value
Prevalence of diarrhoea	17.2	11.8	0.097
Prevalence of ARI	19.5	9.3	0.000
More than usual rest taken			
during pregnancy	37.6	43.6	0.185
Could abstain from heavy			
work during pregnancy	29.0	47.3	0.015
First food to the new-born			
Honey	68.9	50.8	0.000
Water	3.6	2.1	0.331
Breastmilk	6.3	15.5	0.001
Others	21.2	31.5	0.012
Increased food intake during	20.9	30.0	0.000
pregnancy			
Fixed well for defecation	37.4	54.1	0.000
Food consumption			
Bread	3.7	12.6	0.000
Potatoes	55.5	88.2	0.000
Egg	3.7	7.4	0.006
Milk	21.8	25.2	0.005
Stunting	43.0	32.0	0.015
Underweight	52.0	45.0	0.100
MUAC	5.4	4.5	0.696

Table 2: Distribution of the respondents according to health and nutrition status

In terms of the feasibility of the participatory approaches, the tools to ensure community participation have been very useful since there was great enthusiasm created among the community members initially. Gradually, the interest of the SHIs was declined as they were found to be more interested in the income generating activities and considered as an entry point to work with NGO's and have access to external funds. Finding their assumption not true, the attendance of the volunteers (specially the leaders of the SHIs) started thinning but there were other people who came to continue the work since they found it interesting, beneficial and prestigious. Male participation was declining while female participation was increasing. With some facilitation by the female workers, a group of mothers got organized to come together and started saving a very nominal amount of money (about 6 cents a week). Later on, they were linked to the local office of the Women Affairs department under the Ministry of Social Welfare. Through the government's regular programme, they got some skill training like sewing, handicraft, cow fattening, vaccinating chicken etc. These created an incentive to attend growth monitoring. Having found a new world, these mothers became very proactive not only in organizing the growth monitoring sessions, mobilizing the families to bring children for growth monitoring and convincing mothers to ensure

healthy practices at home. Even they were checking their neighbours for better practices.

The local self-help initiatives (most of them are dominated by males) were found to be more interested in income generating activities rather than voluntary work and gradually dropped out one by one. On the other hand, mother's participation was increasing gradually and eventually they took over though they were not even invited in the early days of this project. Ultimately, all of the 13 self-help initiatives (male only) have dropped but 9 new mother groups have evolved who not only invest in income generating activities but also organize and manage about 30 nutrition centres. As a result, even 1 year after closure of SC-UK's financial support, local partner CHESTA could continue their activities in the same project area with 3 staff members instead of 13 originally recruited. Their current salary is earned from a nursery garden, which was established during intervention period.

Discussion

It is clear from the study that there has been significant improvement in the overall malnutrition situation in the area although there had not been as such direct nutrition intervention like 'supplementary food packets' supplied from outside. That is what is generally understood by any large-scale nutrition intervention including Bangladesh Integrated Nutrition Project. However, though this project had wanted to challenge that idea that nutrition situation is not only dependent primarily on feeding practices but also more on ensuring food security, it did not undermine the importance of caring practices and falling sick. The project activities included problem solving analysis at household level to improve caring practices at home and growth monitoring sessions linked to public health services at community level. Though there was some effort to improve the socio-economic condition, it was affected by other external factors than project input. Though in-depth analysis had not been done to see the correlation between the economic variables and nutrition status confounding the caring practices variables, but with the available figures in this report, it was clearly evident that there has been significant improvement in the economic opportunities of the population in general. It becomes more obvious when we look into the current status of homestead land ownership, construction material of houses, expenditure for food, education and treatment etc.

It is true that the extent and level of improvement in nutrition and socio-economic status have been a bit unusual. Opportunities to spend money on food items and other household expenditure also increased substantially which all are difficult to believe an outcome of the project input. Rather, it was found under investigation that there was a racketeer group who were encouraging people to invest around Tk. 120% per year. Almost all but few people had invested money into this syndicate even selling their other properties and withdrawing money from the scheduled Banks. People's income and expenditure was rising in rocket speed. The positive effect is evident on overall increase in asset and lifestyle such as having more TV, spending more on food, education etc. and the income were fattening they were growing bigger everyday. The negative of such sudden boost economy is that it may collapse at any time and that happened with few months of closure of SC-UK's direct input into the project. So, it would be interesting to see how the current achievement is sustained after the collapse and how much the behavioural change can sustain despite economic crisis.

Nevertheless, the authors would like to conclude saying that

- Appropriate tools are essential to ensure community participation in growth monitoring sessions, however;
- Active community participation takes a long time to achieve it's desired outcome but ensures sustained involvement of the community;
- More than the direct nutrition input, other economic opportunities seemed to have played a major role in sharp improvement of nutrition situation in such a short time;
- Decision making process and opportunities to apply the knowledge was crucial in improving the nutrition situation.

References

- 1. Bangladesh Bureau of Statistics. Statistical Pocket Book of Bangladesh 1999.
- 2. Bangladesh Bureau of Statistics. Statistical Yearbook of Bangladesh 1998.

IMPROVING CHILD HEALTH: AN APPRAISAL OF THE ROLE OF RESEARCH

The Working Group on Women and Child Health: François Dabis¹, Marie Louise Newell², Joanna Orne-Gliemann¹, Freddy Perez¹, Anna Coutsoudis³, Valériane Leroy¹, Hoosen Coovadia³

Introduction

Children under 15 years of age represent 30% of the total world population and more in developing countries. Their survival remains one of the most important challenges worldwide. Child morbidity and mortality (in children under five years of age) can be substantially reduced through appropriate evidence-based and relatively simple health interventions such as infant immunization, oral re-hydration therapy for diarrhoeal diseases and other management strategies of common childhood illnesses. Research has helped to quantify the extent of child health problems, identified and evaluated strategies to improve child health and has provided evidence of the effectiveness of interventions. The reduction of child morbi-mortality related to measles and malaria would not have been possible without the knowledge acquired by research.

A large proportion of deaths in children is preventable. However, although child mortality has decreased by about 15% in relative terms since 1990, rates remain above 100 per 1000 live births in more than 40 countries (1). In 2000, it is estimated that 182 million children of pre-school age in developing countries suffer from growth retardation, particularly in a certain number of African countries where malnutrition rates tend to increase (2). Furthermore, it appears that the immunization coverage of the six standard antigens of the WHO Expanded Programme on Immunization has been declining over the past few years (3).

These facts call for a reappraisal of the role of research in the field of child health in developing countries. The aim of this paper is

¹ Institut de Santé Publique, d'Epidémiologie et de Développement (ISPED), Université Victor Segalen - Bordeaux 2, Bordeaux, France

 $^{^{\}rm 2}$ Centre for Paediatric Epidemiology and Biostatistics, Institute of Child Health, London, United Kingdom

 $^{^{3}}$ Department of Paediatrics and Child Health, University of Natal, Durban, South Africa

to critically examine the present activity of institutions involved in child health in developing countries and particularly their research agendas. What is the adequacy between the investments in child research and the burden of child diseases? What are the assets and the weaknesses in the designing of research programmes and in the implementation of research results?

The degree of involvement of research actors influences the development of both knowledge and adequate and efficient tools to improve child health. The maximization of the potential of research is therefore fundamental to the sustainability of this progress and to the tackling of emerging child health problems in developing countries.

Method

We carried out a review of the literature published between January 1990 and June 2001. The Medline search strategy was based on the combination (Boolean operator AND) of "child" and "developing countries" and the following keywords (in alphabetical order): breast feeding, diarrhoeal diseases, health system, HIV infection, immunization, injuries, malaria, measles, mental health, mortality, opportunistic diseases, oral health, perinatal health, respiratory infections, sanitation and welfare. 4 701 references were identified, 488 selected based on their title and 137 on their content. Unpublished documents and reports issued by major institutions in the field of child health were identified and compiled. The purpose of this review of the literature was to appreciate the privileged or neglected areas of research and to understand some of the factors influencing the implementation of research results.

A survey was carried out via electronic mail from February to June 2001 addressing more than 90 informants. The target population consisted of worldwide institutions involved in the field of child health research: national entities such as medical research councils, universities, foundations, international-bilateral agencies, non-governmental organizations, etc. The objectives of this survey was to describe the current and past research activities undertaken in the field of child health research since 1990 and to highlight the challenges pertaining to an adequate research priority setting process and the implementation of research results.

Since no pre-established and exhaustive list of institutions involved in the field of child research in developing countries exists, the institutions were identified based on the results of the literature review, on the network of collaborating professionals of our Working Group and on further information collected via Internet. This crosssectional survey was undertaken through a standardized questionnaire, with open- and semi-open-ended questions. The survey data were entered in the Statistical Package for Social Science (SPSS) 9.0 programme. The 17 items of the questionnaire were coded according to the following groups of variables: the type of institutions targeted by the survey and having replied to the questionnaire; their geographical location; the profession of the participants to the survey; the geographical setting of their research activities; the type of research undertaken; the research area and approaches covered; the child health priorities according to the literature and to the survey; their criteria for setting research priorities; their perceived objectives of child health research; the role of research in improving child health; the child health policies and interventions designed based on the research findings; the areas where research was not implemented; the reasons for this non-implementation; and finally their perceived neglected fields of child health research.

Results

Magnitude of child morbidity and mortality: key findings of research during the last decade

The literature review enabled us to highlight the multiplicity of research strategies in the field of child health. Table 1 presents the different types of research susceptible of improving the health of children: each of these approaches needs to be considered together to understand and solve child health problems in developing countries.

Tune of research	Objective	Examples of needs or
Type of research	objecture	recent advances
Descriptive epidemiology and burden of disease	To describe the magnitude of the problem, to identify the causes of child illness and death in different communities	The importance of child injuries and abuse is greatly unrecognized (4)
Aetiology and mechanisms	To understand the determinants of childhood diseases	S pneumonia causes 50% of all early infant meningitis (5)
Development of interventions	To design the most appropriate strategies to improve child health	Teaching mothers to promptly provide anti-malarials to sick children at home decreases under five mortality <i>(</i> 6 <i>)</i>
Impact and evaluation	To measure the effect of the implemented strategies and raise new research questions	Less than half of children in western and central Africa are currently receiving measles vaccine (7)
Health systems	To increase the effectiveness of child health interventions and services	Improved quality of hospital care may lead to better outcomes in severely ill children (8)
Policy	To analyze retrospectively and monitor prospectively the scaling- up of child health and nutrition interventions	Social marketing of insecticide-treated nets contributes to improving child surviva (9)

Table 1: The different types of research in the area of childhealth and nutrition

Among the ten most important conditions in the global burden of disease, five are major childhood diseases. Although the increasing importance of injuries and non-communicable diseases as causes of child mortality was highlighted in the 1990s (10), ill health associated with infectious diseases remains the most important direct cause of death and disability among children world wide, especially in developing countries (11,12). Diarrhoeal and respiratory diseases are by far the most important causes of mortality in children under five years of age, accounting for an estimated eight million deaths in this age group globally (13) (Table 2).

All causes	Rank	% of total
Lower respiratory infections *	1	8.2
Diarrhoeal diseases *	2	7.2
Perinatal conditions *	3	6.7
Unipolar major depression	4	3.7
Ischaemic heart disease	5	3.4
Cerebrovascular disease	6	2.8
Tuberculosis	7	2.8
Measles *	8	2.6
Road-traffic accidents	9	2.5
Congenital abnormalities *	10	2.4
* primarily or exclusively childhood diseases		Source: WHO 1996 (13)

Table 2: World leading causes of Disability Adjusted Life Years
(DALYs)4 in 1990

Five groups of explanatory factors associated with child mortality have been proposed: fertility behaviour, nutritional status of children and patterns of breast feeding, maternal and child health status and use of health services, environmental health and socio-economic factors (14). Although adequate feeding and good nutritional status have long been recognized to preserve children's health, malnutrition in children remains a major public health problem in developing countries, where a third of all children under five years suffer from growth retardation (2). Results from several studies have highlighted the long-term consequences of mild and moderate forms of malnutrition (15), the benefits of appropriate breast feeding (16) and prevention of micronutrient deficiencies (17). In a recently published pooled analysis of data from six countries in Africa and Latin America (18), the positive effects of breast feeding in reducing mortality in infants aged six to 11 months was confirmed. Zinc supplementation has been shown to improve the duration and severity of diarrhoeal episodes, and to prevent the incidence of diarrhoea, acute respiratory infections and malaria (19). Treatment protocols based on nutritional therapy using inexpensive, locally available foods, vitamin and mineral supplements and specific anti-microbial therapy have been shown to be successful for the short-term management of children with persistent diarrhoea (20). These research findings have subsequently been integrated in the WHO/UNICEF Integrated Management of Childhood Illnesses (IMCI) strategy. The IMCI strategy designed in 1996 to reduce childhood deaths, illnesses and disabilities and to improve the growth and development of children, had been implemented in more than 60 countries by 1999 (21).

⁴ DALY's are indicators of the time lived with a disability and the time lost to premature mortality.

Low birth weight is a strong predictor of growth and child survival, and has recently been shown to be associated with impaired immune function, persisting throughout childhood, and poor cognitive development in neonates and infants (22). In Bangladesh, where 50% of new-borns are of low birth weight, many infant deaths from pneumonia or respiratory infections and diarrhoea could be prevented if low birth weight were eliminated (22).

Infant and child health is also known to be related to the maternal environment. The Kangaroo Care method, which encourages skin to skin contact between mother (or father) and a premature new-born, was tested in Colombia (23) and in a pilot study in Zimbabwe (24). These studies confirmed the safety of this approach, which improved survival of pre-term babies.

The impact on child health of interactions between health personnel, health services and family care is increasingly a focus for operational research, integrated into broader reform of the health system at primary health care level (25). Research aimed at understanding behaviour and beliefs of health care providers has helped to clarify why health workers miss opportunities to immunize children (26), and to understand health provider performance.

The beneficial role of parental education was highlighted in Ethiopia (6), where the effect on under five mortality of teaching mothers to promptly provide anti-malarials to sick children at home was assessed in a randomized controlled trial. In the context of the WHO Roll Back Malaria initiative, the authors conclude that increased attention should be given to what family and communitybased efforts can achieve when interventions are properly designed and applied in a receptive setting.

To ensure the provision of appropriate and relevant child health services in specific settings, the local environmental, social, and health resources need to be assessed. New initiatives illustrate the usefulness of Geographical Information Systems (GIS) to evaluate the effects of health care provision on the incidence of acute respiratory infections. In Bangladesh, the investigation of the spatial variation in health care resources and the association with adverse disease outcome, such as acute lower respiratory infection mortality, has enabled the planning of improved service delivery, which should in turn reduce child mortality (27). Environmental concerns have also allowed increased focus on factors at household level, in particular the consequences of indoor air pollution (28).

Survey findings

Profile of the participants

Out of 91 questionnaires sent, 48 questionnaires were received. Three questionnaires were rejected because too incomplete, therefore 45 questionnaires were analyzed, i.e. a response rate of 49.5% (Table 3). All types of institutions targeted are represented in the survey results. However, academic institutions represent more than one third of the survey population (40%) against 13.4% for international and bilateral agencies.

Type of institution	Questionnaires sent		Questior recei	Participatio n rate	
	Number (a)	%	Number (b)	%	% (b/a)
Academic institution	29	31,8	18	40,0	62,9
Public institute of	14	15,4	8	17,8	57,0
research					
National, governmental	12	13,2	5	41,5	41,5
institution					
Bilateral-international	19	20,9	6	31,5	31,5
institution					
NGO (Non-Governmental	10	11,0	5	50,0	50,0
Organization)					
Other	7	7,7	3	42,8	42,8
Total	91	100,0	45	100,0	49,5

Table 3: Survey answering rate according to the type ofinstitution - February-June 2001

The participation to the survey was more important for departments involved in mother and child health (26.7%), nutrition (15.5%) and public health in general (15.5%). Most of the participants to the survey define themselves as epidemiologists (33.3%) or public health specialists (28.9%) and 18% of participants are clinicians. The 91 institutions targeted are located in 27 countries, over the five continents (Map 1). Almost all the institutions targeted in Latin America have answered to the questionnaire. The response rate of north-American institutions (31.6%) is the lowest with less than one third of the questionnaires returned. The geographical participation to the survey remains homogenous with 20 to 30% of institutions located in Europe, Africa and Asia, and 10 to 15% on the American continent.



Research activities

Table 4:	Involvement	of	the	particip	ating	inst	titutions	in
	different child	d he	alth	research	areas	and	approach	les,
	survey Februa	ry-c	June	2001				

Research area	Academic	Public	National,	Bilateral	NGO	Other	Total	n=45
	institution	research	governmental	international	n=5	n=3	%	61
	n=18	institute	institution n=5	institution n=6				
		n=8						
Perinatal Health	11	3	4	2	1	1	22	14.8
Malaria	1	3	1	1	0	1	7	15.5
Nutritional disorders	13	2	3	2	4	0	24	53.3
Micronutrients	9	3	0	3	5	1	21	46.6
Respiratory diseases	3	0	1	3	1	0	8	17.7
Diarrhoeal diseases	4	3	1	1	0	0	9	20.0
Other infectious diseases	5	3	2	1	1	1	13	28.8
HIV/ AIDS	7	1	2	1	0	2	13	28.8
Vulnerable children	4	0	0	1	1	2	8	17.7
Breast feeding	9	3	1	3	1	0	17	37.7
Child growth and development	7	2	1	1	0	0	12	26.6
Total*	73	23	16	19	14	8	154	

Table 4: Involvement of the participating institutions in different child health research areas and approaches, survey February-June 2001 (continued)

Research area	Academic	Public	National.	Bilateral	NGO	Other	Total	n=45
	institution	research	governmental	international	n=5	n=3	%	51
	n=18	institute	institution n=5	institution n=6				
		n=8						
Community	12	3	2	6	6	4	33	73.3
approach		_				-	_	
Algorithms	3	2	0	0	2	0	7	15.5
Development of	4	6	2	3	0	1	16	35.5
Health system	11	1	3	5	1	1	22	48.8
Descriptive epidemiology	5	5	2	4	3	1	20	44.4
Operational research	3	3	0	7	2	0	15	33.3
Total*	38	20	9	25	14	7	113	

 $\boldsymbol{\ast}$ Represents the total number of research areas and approaches mentioned by the institutions

 $^{\rm 1}$ indicates the coverage rate of research themes and approaches covered by the participating institutions

It appears that more than half the study population works in the field of child nutrition and micronutrient deficiencies (Table 4). The second most frequently mentioned area of research is perinatal health, highlighting the importance of pregnancy and the first years of life in relation to the growth and development of children. On the contrary, infectious diseases, especially malaria, diarrhoeal and respiratory diseases, as well as research on vulnerable children in developing countries appear less frequently in the activity of these institutions. The participating institutions mainly undertake research concerned with the understanding of local conditions: the community approach is mentioned in most cases as a privileged strategy of research. The study institutions also express their concern for describing and measuring child health, for improving the health systems but less for the evaluation of on-going interventions or policies.

The figures 1 and 2 illustrate the differences between the research undertaken by the institutions participating to the survey and the child health priorities in developing countries as stated in the literature. These figures show that perinatal health is the second most frequently mentioned area of research but the forth cause of mortality as stated in the literature (18%). On the contrary, the interest of the institutions participating to the survey for diarrhoeal and respiratory diseases and measles, well stated child health priorities, is less important.

Figure 1: Main causes of death in children under five in developing countries, 1995*



* According to Murray CJL and Lopez AD, 1996 and Pelletier DL et al, 1995 $^\circ$ According to ONUSIDA 2000





For almost half of the institutions, the definition of child health research priorities abides to internal strategies and decisions (42.2%), i.e. the personal and/or professional interest of researchers and other specialists concerned with child health. The second factor guiding their research activities is the existence of a network, of communication and collaboration between the different actors of child health in developing countries. The child health research activities undertaken by the participating institutions cover homogeneously Africa, Latin America and Asia where the majority of developing countries are located. The most frequently mentioned countries are, by alphabetical order, Bangladesh, Cameroon, Ecuador, Kenya, Peru, South Africa and Tanzania.

Perceived role of research in improving child health

The survey results show that the majority of the institutions consider research as a tool contributing to improve child health in developing countries. More than 60% of the academic institutions and public research institutes consider research as an instrument of health strategy, whereas international agencies are more likely to underline the operational potential of research.

The importance of the implementation of research results, through health interventions or policies, was estimated by the number of examples mentioned by the 45 participating institutions. More than 87% of the responses relate to less than four examples of research results applied, academic institutions mentioning the greatest number of examples. The field of research the most represented is nutrition, and specifically research into micronutrients (21.3%), nutritional interventions (16.8%) and breast feeding practices, and also the field of perinatal health (Table 5). On the contrary, less than 15% of the examples relate to the prevention of infectious diseases and the protection of vulnerable children.

ventions or poli	icies- survey	February-Jun	e 2001
Research area	Policy	Intervention	Total
	. 47 0/		m = 0 0/1

Table 5: Research areas implemented through health inter-

Research area	ch area Polic		cy Intervention			Total		
	n=47	%	n=42	%	n=89	%1		
Perinatal health	7	14.9	8	19.0	15	16.8		
Malaria	3	6.4	1	2.4	4	4.5		
Nutritional disorders	5	10.7	10	23.8	15	16.8		
Micronutrients	12	25.5	7	16.6	19	21.3		
Respiratory diseases	1	2.1	2	4.8	3	3.3		
Diarrhoeal diseases	3	6.4	1	2.4	4	4.5		
Other infectious diseases	2	4.3	1	2.4	3	3.3		
HIV/AIDS	3	6.4	2	4.8	5	5.6		
Vulnerable children	0	0	3	7.1	3	3.3		
Breast feeding	7	14.9	3	7.1	10	11.2		
Child growth and development	4	8.5	4	9.5	8	9.0		
Total*	47	100.0	42	100.0	89	100.0		

* Several areas may be mentioned by the participating institutions

¹ indicates the proportion of research results implemented in each area

A minority of institutions, 21 of 45, specified the amount of their financial resources allocated to child health research in developing countries. Furthermore, the scale of figures mentioned varies from 10 000 US\$ to 600 000 000 US\$ per year.

Constraints in implementing research results

Almost 50% of the survey institutions do not mention examples of research areas where the results have failed to be implemented. Among the responses analyzed, the category of nutritional interventions is the most frequently mentioned, so as the field of the development of biomedical tools and child care algorithms.

The main factor contributing to the implementation of research results is political support, stated in more than 25% of answers (Table 6). The survey institutions also mention the importance of conflicts of interest between different child health actors and the lack of financial support as some of the constraints to the implementation of research results.

Table 6: Constraints in the implementation of research resultssurvey February-June 2001

Reasons of non-	Academic	Public	National,	Bilateral,	NGO	Other	То	tal
implementation	institution	research	govern-	interna-	n=5	n=3		
	n=18	institute	mental	tional				
		n=8	institution	agency				
			n=5	n=6				
							n=45	%
Among the							n=20	%
answers							11 2)	70
Insufficient funds available	7	1	0	0	0	0	8	27.6
Lack of political support	8	1	1	3	0	0	13	44.8
Results dissemination	1	0	0	1	1	0	3	10.3
Lack of applicability	2	1	0	2	1	0	6	20.7
Inadequacy between selection of research area and research needs/means	1	1	0	1	0	0	3	10.3
Conflict of interest	5	3	1	1	0	0	10	34.4
Other	3	3	1	0	0	0	7	24.1
Total responses*	31	12	5	12	5	3	66	

Almost 80% of the institutions participating to the survey mention four neglected child health research areas and approaches, the majority of them (46.6%) mentioning two to three examples. The main areas of child health research considered as neglected are the field of vulnerable children, affected by the increasing incidence of injuries and non-communicable diseases, but also the field of nutritional disorders. Infectious diseases are rarely mentioned as neglected areas of child health research. In the category of the research approaches, the survey institutions state research gaps in the field of knowledge on local conditions and interventions, of community development and cultural determinants.

Discussion

Interpreting the survey findings

It appears in the literature that the six main causes of child mortality in developing countries are, by decreasing order, malnutrition, diarrhoeal diseases, respiratory diseases, perinatal health, HIV/AIDS (specifically in Africa), measles and malaria (Table 7). Although the survey results also underline the importance of preventing malnutrition, only one institution out of five is involved in research on respiratory diseases and malaria, and one out of 10 in the field of measles prevention.

Table 7: Confrontation of the literature review and the survey
results on child health research in developing
countries, January 1990-June 2001

Research area	Literature	Survey among k	Survey among key child health research actors			
	Cause of	Researched ²	Implemented ²	Neglected ²		
	death1					
Malnutrition	55.0 (1)	78.0 (1)	73.3 (1)	33.3 (1)		
Diarrhoeal	19.0 (2)	26.0 (4)	8.8 (5)	2.2 (5)		
diseases						
Respiratory	19.0 (2)	20.0 (5)	6.6 (7)	2.2 (5)		
diseases						
Perinatal	18.0 (4)	51.0 (2)	30.3 (2)	17.7 (2)		
health						
HIV/AIDS°	10.0 (5)°	29.0 (3)	11.1 (3)	13.3 (3)		
Measles	7.0 (6)	9.0 (7)	6.6 (7)	6.6 (4)		
Malaria	5.0 (7)	20.0 (5)	8.8 (5)	2.2 (5)		
				() = rank		

¹ Main causes of death among children in developing countries (%):

According to Murray CJL and Lopez AD, 1996 and Pelletier DL et al, 1995 ° According to UNAIDS 2000

² Proportion of institutions mentioning these research areas (%)

The literature review provided examples of successful research results, which are not implemented to the benefit of child health in developing countries. The 45 institutions indeed mention very few examples of research results applied through health interventions or policies. Furthermore these institutions underline almost unanimously the difficulties related to the lack of political support and to the conflicts of interest between the different child health specialists, animated by diverging ambitions and ideologies.

The list of institutions contacted for this survey, characterized by their administrative profile and their geographical location, is not exhaustive but has targeted some of the key actors involved in the field of child health in developing countries. The 49.5% survey response rate is satisfactory. The sample of these actors involved in child health in developing countries is diverse enough in terms of profile and geographical location, and thus respects the representativeness expected when sending the questionnaire.

Nevertheless, it is also important to underline the fact that the context of the survey was the response to a demand from the Global Forum for Health Research. The latter has insisted on distinguishing child health and child nutrition, arguing that nutritionists are too often absent of the field of child health. Thus, the outline of certain items of the questionnaire, such as "Has your research on child health and nutrition led to the designing of national policies? Please give examples" may have induced an information bias, the institutions answering to the questionnaire specifically insisting on their research undertaken in the field of child nutrition. However the importance of nutrition in the survey results also corresponds to the fact that malnutrition is a major factor associated to child morbidity and mortality and thus a public health priority that needs to be extensively researched.

Furthermore, the quality and exhaustiveness of the responses vary according to the questionnaires and participating institutions. Thus, the presentation of the data collected in terms of frequency of response increases the representation of the institutions that responded the most accurately. Similarly, the statement of their involvement in different child health research areas in developing countries depends both on the knowledge and the perception that these institutions have of their practice. For example, several institutions do not mention being involved in operational research whereas their reports of activities show the contrary.

In spite of the potential selection and information bias, this survey remains an original research tool that has highlighted essential points on the challenges of child health research in developing countries.

Perspectives

The review of the literature and the survey results highlight major advances in the field of child health since 1990, and underline the fundamental role of research in guiding this progress. They also show the need for an increased attention to neglected areas of research such as respiratory diseases and social vulnerability of children in developing countries.

To maximize the efficiency and responsiveness of child health and nutrition research, priority setting strategies have been designed by WHO, the Global Forum for Health Research (GFHR) and the Council for Health Research and Development (COHRED) (13,29,30). Each of these institutions recommends that the setting of research priorities needs to be based on evidence, to consider local ownership and partnership, to respect ethical issues and to address the interactions between child health and other sectors. The multiplicity of child health determinants calls for a multisectoral partnership, a combination of socio-economic policies and health interventions. Further research to inform such policy packages is therefore essential.

Research is often restricted to basic research activities. Thus for certain NGO's or other institutions participating to the improvement of child health in developing countries, exploratory or operational missions are not viewed as research activities whereas these field experiences bring valuable knowledge necessary to the implementation of research. Similarly, the financing of studies on child health in developing countries is not considered as an involvement in the field of research even though financial decisions have a major influence on the orientation of research activities, on the credit and priority given to certain areas of research.

Even though the survey results do not allow rational conclusions on the expenses for child health research in developing countries and the literature lacks accurate estimates of global spending allocated for research on the main diseases or risk factors, the Global Forum for Health Research reports an imbalance between the disease burden and research and development investments for the world's two biggest killer diseases. Although pneumonia and diarrhoeal diseases represent 11% of the global burden of diseases, and a much higher percentage in children, only an estimated 0.2% of the total amount spent on research and development is allocated to these diseases (29). Over two million children die every year from pneumonia and one million of pertussis and measles. However, acute respiratory illnesses receive only 0.15% of the research and development budget for health, which amounts to only US\$ 0.51 per DALY (Disability Adjusted Life Years),

compared to US\$ 85 for HIV, US\$ 13 for asthma, and US\$ 0.32 for diarrhoeal disease (31). This gap between the resources and needs for health research is largely due to the neglect of child health research in developing countries and to the North-South inequalities in the means invested in research, the majority of funds originating from the North. The allocation of resources for health, and even more in the field of child health research has major consequences in terms of child morbidity and mortality, of sociopsychological prejudices for families and communities, of costeffectiveness for health systems and nations.

This study confirms the need for child health research in developing countries to be based on evidence and thus on the development of national capacity for research. The adoption of Essential National Health Research (ENHR) strategies by national governments for example emphasizes country priorities, equity in health care and translation of research into policy and action. Research activities need to respond to local health needs: in the field of mother-to-child transmission of HIV for example, the ethical basis of the research project (32,33), the feasibility of the studies and the probability of implementation of the results (34) are conditioned by an adequacy with the demand from the beneficiaries of the research.

Finally, the results of both the survey and literature review highlight the fact that field research activities do not always directly respond to the needs of children living in developing countries. During a workshop organized in Geneva in April 2000 by the GFHR was mentioned a project of mapping on-going research activities world-wide, in order to understand on small and large scales the temporal evolution and spatial distribution of financial investments in the field of child health and to contribute to guide more precisely research agendas. The need for such baseline assessments also calls for increased communication and exchange of research initiatives, for the development of research partnerships between and among institutions in developed and developing countries.

Conclusion

Child health in developing countries is a major challenge for national and international actors engaged in improving world health. In particular, the institutions involved in research play a fundamental role in informing and guiding public health decision makers on the most pertinent strategies and interventions to implement in order to preserve and improve child health in developing countries. Strengthening national research capacities to respond to local research needs and increasing ownership of research is fundamental for the implementation and sustainability of research findings at a population level. A dynamic interaction between researchers, policy-makers, advocacy groups and funding institutions is essential to ensure that child research priority setting is based on sound evidence and remains at the top of the international development agenda.

Acknowledgements

We thank E. Mouillet (ISPED) for assisting us with the literature review. Unpublished material and reports were made available by A. de Francisco (Global Forum for Health Research, Geneva) and O. Fontaine (WHO, Geneva). The Global Forum for Health Research commissioned us to prepare a report on the status of Child Health and Nutrition Research, which forms the basis of this review paper.

We also thank the participants in the Global Forum for Health Research Workshop, Geneva, Switzerland, 18-21 April 2001 for their valuable input in reviewing the background document used for this paper. Special thanks are due to the participants in the electronic survey.

References

- 1. WHO. World Health Report 1999. Geneva: World Health Organisation, 1999;126.
- 2. de Onis M, Frongillo EA and Blossner M. Is malnutrition declining? An analysis of changes in levels of child malnutrition since 1980. *Bull World Health Organ.* 2000;**78**:1222-33.
- 3. WHO. Vaccine preventable diseases monitoring system, global summary, 1999. *Geneva: World Health Organisation*, 1999.
- 4. Deen JL, Vos T, Huttly SR and Tulloch J. Injuries and noncommunicable diseases: emerging health problems of children in developing countries. *Bull World Health Organ.* 1999;**77**:518-24.
- WHO Young Infants Study Group. Bacterial etiology of serious infections in young infants in developing countries: results of a multicentre study. *Pediatr Infect Dis J.* 1999;**18**(Suppl):S17-S22.
- 6. Kidane G and Morrow RH. Teaching mothers to provide home treatment of malaria in Tigray, Ethiopia: a randomized trial. *Lancet.* 2000;**356**:550-5.
- 7. Cutts FT, Henao-Restrepo A and Olive JM. Measles elimination: progress and challenges. *Vaccine*. 1999;**17**:S47-S52.
- 8. Nolan T, Angos P, Cunha AJ, Muhe L, Qazi S, Simoes EA, Tamburlini G, Weber M and Pierce NF. Quality of hospital care for seriously ill children in less-developed countries. *Lancet.* 2001;**357**:106-10.
- Armstrong Schellenberg JRM, Abdulla S, Nathan R, Mukasa R, Marchant TJ, Kibumbih N, Mushi AK, Mponda H, Minja H, Mshinda H, Tanner M and Lengeler C. Effect of large-scale social marketing of insecticide-treated nets on child survival in rural Tanzania. *Lancet.* 2001;**357**:1241-7.

- 10. Murray CJL and Lopez AD. The global burden of disease: methods, results and projections. *Cambridge: Harvard University Press*, 1996.
- Rice AL, Sacco L, Hyder A and Black RE. Malnutrition as an underlying cause of childhood deaths associated with infectious diseases in developing countries. *Bull World Health Organ.* 2000;**78**:1207-21.
- 12. Gwatkin DR and Guillot M. The burden of disease among the global poor: current situation, future trends, and implications for strategy. *Washington: World Bank*, 2000;44.
- 13. Ad Hoc Committee on Health Research Relating to Future Interventions Options. Investing in health research and development. *Geneva: WHO*, 1996;278.
- Rutstein SO. Factors associated with trends in infant and child mortality in developing countries during the 1990s. Bull World Health Organ. 2000;78:1256-70.
- 15. Pelletier DL, Frongillo EAJ, Schroeder DG and Habicht JP. The effects of malnutrition on child mortality in developing countries. *Bull World Health Organ.* 1995;**73**:443-8.
- Fawzi WW, Herrera MG, Nestel P, el Amin A and Mohamed KA. A longitudinal study of prolonged breast-feeding in relation to child undernutrition. Int J Epidemiol.1998;27:255-60.
- 17. Darnton-Hill I, Mora JO, Weinstein H, Wilbur S and Nalubola PR. Iron and folate fortification in the Americas to prevent and control micronutrient malnutrition: an analysis. *Nutr Rev.* 1999;**57**:25-31.
- WHO Collaborative Study Team on the Role of Breast feeding on the Prevention of Infant Mortality. Effect of breast feeding on infant and child mortality due to infectious diseases in less developed countries: a pooled analysis. *Lancet.* 2000; 355:451-5.
- Osendarp SJ, van Raaij JM, Darmstadt GL, Baqui AH, Hautvast JG and Fuchs GJ. Zinc supplementation during pregnancy and effects on growth and morbidity in low birth-weight infants: a randomized placebo controlled trial. *Lancet.* 2001;**357**:1080-5.
- 20. International Working Group on Persistent Diarrhoea. Evaluation of an algorithm for the treatment of persistent diarrhoea: a multi-centre study. *Bull World Health Organ.* 1996;**74**:479-89.
- 21. Tulloch J. Integrated approach to child health in developing countries. *Lancet.* 1999;**354**(Suppl 2): S16-S20.
- 22. United Nations Administrative Committee on Coordination and Sub-Committee on Nutrition. Low birthweight: Report of a meeting in Dhaka, Bangladesh on 14-17 June 1999. *Geneva: ACC/SCN*, 2000.
- Charpak N, Ruiz-Pelaez JG and Charpak Y. Rey-Martinez Kangaroo Mother Programme: an alternative way of caring for low birth weight infants? One-year mortality in a two-cohort study. *Paediatrics*.1994;**94**:804-10.
- 24. Karambani RA, Chidede O and Kowo DT. Kangaroo care versus incubator care in the management of well pre-term infants a pilot study. *Ann Trop Paediatr.* 1998;**18**:81-6.
- Bethell C, Peck C and Schor E. Assessing health system provision of well-child care: the promoting healthy development survey. *Paediatrics*. 2001;**107**:1084-94.
- Hutchins SS, Jansen HA, Robertson SE, Evans P and Kim-Farley RJ. Studies of missed opportunities for immunization in developing and industrialized countries. *Bull World Health Organ.* 1993;**71**:549-60.
- 27. Ali M, Emch M, Tofail F and Baqui AH. Implications of health care provision on acute lower respiratory infection mortality in Bangladeshi children. *Soc Sci Med.* 2001;**52**:267-77.
- 28. Bruce N, Perez-Padilla R and Albalak R. Indoor air pollution in developing countries: a major environmental and public health challenge. *Bull World Health Organ.* 2000;**78**:1078-92.

- 29. Global Forum For Health Research. The 10/90 report on health research. *Geneva: Global Forum for Health Research*, 2000;155.
- 30. Council on Health Research and Development. The ENHR Handbook, A guide to Essential National Health Research. *Geneva: COHRED*, 2000;18.
- 31. WHO. WHO news and activities Acute respiratory infections: the forgotten pandemic. *Bull World Health Organ.* 1998;**76**:101-3.
- 32. Shapiro HT and Meslin EM. Ethical issues in the design and conduct of clinical trials in developing countries. *N Engl J Med.* 2001;**345**:139-42.
- 33. Dabis F, Msellati P, Newell ML, Halsey N, Van de Perre P, Peckham C and Lepage P. Methodology of intervention trials to reduce mother to child transmission of HIV with special reference to developing countries. International Working Group on Mother to Child Transmission of HIV. *AIDS*. 1995;**9**:S67-74.
- 34. Msellati P, Hingst G, Kaba F, Viho I, Welffens-Ekra C and Dabis F. Operational issues in prevention of mother-to-child transmission of HIV-1 in Abidjan, Côte d'Ivoire 1998-1999. Feasability of providing voluntary counselling and testing, short regimen of zidovudine and promoting alternatives to breastfeeding. *Bull World Health Organ*.2001;**79**:641-7.

Table of contents

Foreword
Kolsteren P. Growth monitoring and promoting growth and development. Synthesis of the colloquium
Beghin I. Overview of how health services tackle promotional activities for growth and development
Engle PL. Early child development: Should we have global indicators?
Bonnet D. Malnutrition : A subject-matter for anthropology?
De Onis M. The WHO global database on child growth and malnutrition: methodology and applications
Roberfroid D. Health professionals' perceptions of growth monitoring and promotion programmes in selected developing countries
Hoerée T. Health promotion practice of rural health workers in Bolivia - a qualitative exploration
Rubin de Celis Talavera E. Social representations and meanings of infant health lessons for health education
De Suremain CE. Local perceptions of child's health, growth and development among Bolivian mothers
Lefèvre P. Appropriation of the growth chart by mothers of under fives in Bolivia
Tonglet R. Is formal screening more effective than trusting mothers' feeling?
Hall D. Is growth and development monitoring in children really useful?
Bossyns P. Under-fives' clinic : an obligation to change the paradigm

Trèche S. Complementary foods in developing countries: importance, required characteristics, constraints and potential strategies for improvement	.132
Brabin BJ. Cultural determinants of child health and growth in developing countries	.149
Bouville JF. Current and hypothesized psychosocial indicators of "care for nutrition" (caregiving behaviours and interactions that optimize the child's use of food)	.162
Menon P. An ethnographic study of the influences on maternal decision-making about infant feeding practices in rural Bangladesh	.170
Duffield A. The relationship between wealth and malnutrition in the highlands of Ethiopia	.186
Blaise P. Child-centred care in African health care systems: Why is there so little of it? And what can be done?	.200
Pelto GH. Promoting child well-being: the case for integrated growth and development interventions	.222
Latham MC. Trends in nutrition policy and programmes and how they focus on growth and development	.233
De Ronne N. How the growth and development programme was put in place in Flanders and what were its developments over time	.249
Morley D. Let's move growth monitoring out of limbo	.253
Coulibaly F. Evaluating the quality of growth monitoring and promotion programmes in Côte d'Ivoire: Maternal satisfaction and normative assessment	.260
Ratsivalaka M. Promoting growth and development of under-fives seecaline – World programme in Madagascar	.274
Berggren G. Assisting mothers and caretakers to adopt behaviours that promote child growth and development: The HEARTH programme in Haiti, Vietnam and elsewhere	.282
Roberts E. Improving child health in Myanmar	.299

De Ronne N. Preventive Child Support in Belgium	310
Benguigui Y. The IMCI strategy in the region of the Americas: Impacts on infant mortality, health care quality and child development	313
Francois I. A randomized trial for the evaluation of a new model of routine child health care in Ouagadougou, Burkina Faso: The effects of changing practices and attitudes of the health staff	327
Sejas E. Development and testing of an intervention strategy for improving participation of parents in promotion of growth and development of pre-school children in Bolivia	.341
Hussain M. Improving nutrition situation without supplementary feeding: Experience from SC-UK projects in Bangladesh	344
Orne-Gliemann J. Improving child health: an appraisal of the role of research.	354