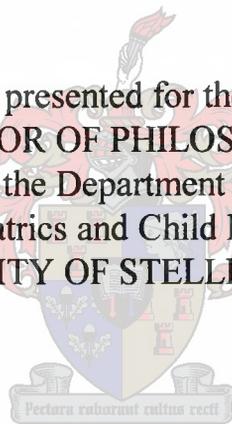


# Community-based growth monitoring in a rural area lacking health facilities

by

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## **DECLARATION**

I, the undersigned, hereby declare that the work contained in this dissertation is my own original work and has not previously in its entirety or in part been submitted at any university for a degree.

Signature:

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## ABSTRACT

A community-based growth monitoring (GM) project was established in a rural village in KwaZulu-Natal. The project is an example of community-based activities that were based on a participatory approach of problem assessment and analysis. The first phase of the study comprised of a situation assessment. The aim was to evaluate the nutritional status and related factors of children aged 5 years and younger. It included a cross-sectional survey (questionnaire and anthropometric measurements), focus group discussions and interviews with key informants. From a nutritional point of view, the situation assessment identified a need for regular GM of infants and small children, increased availability of foods rich in micro-nutrients, and nutrition education.

Relevant findings of the situation assessment were used during a project planning workshop that was attended by community representatives. The community's concern about the health of the preschool children and the lack of health facilities, and the need for regular weighing of their children prompted the establishment of a community-based GM project.

The GM project was run by nutrition monitors, through home-based centres (named *Isizinda*). Monthly activities at the *Isizinda* included GM, nutrition education, and recording of morbidity and mortality data. Children who were either in need of medical attention or showed growth faltering were referred to the nearest clinic. During the latter half of the study, the GM project was integrated with a household food production project and the *Isizinda* served as promotion and training centres for agricultural activities.

Project activities were continuously monitored by reviewing the attendance register, scrutinising the *Isizinda* files, observation and staff meetings. Community meetings (at least twice a year) allowed for two-way feedback and addressing questions and concerns.

Acceptability of the GM activities was measured in terms of attendance and maternal perceptions. The coverage of the *Isizinda* project was estimated at approximately 90% and at least 60% of these children were adequately covered. The *Isizinda* data showed an equal distribution of child contacts over the various age categories and was representative of the community. The attendance data suggest that community-based GM is a viable option to be used for screening and nutrition surveillance, and as platform for nutrition education.

Most mothers comprehended the growth curve. Positive behavioural changes have been observed in the community and the *Isizinda* data showed a steady decline in the prevalence of diarrhoea.

The Ndunakazi mothers were appreciative towards the *Isizinda* project because of a better understanding of the benefits of regular GM. They expressed a sense of empowerment regarding the knowledge that they have gained. The community had a strong desire for the project to continue.

The *Isizinda* project showed that community-based GM can provide the infrastructure for developing capacity for agricultural activities within the community. Data from the household food production project showed that maternal knowledge regarding nutritional issues can be improved through nutrition education given at the GM sessions and that, when GM is integrated with agricultural activities, a significant improvement in child malnutrition can be obtained. The *Isizinda* project falls within the framework of the Integrated Nutrition Programme, and can bridge the gap in areas which lack health facilities.

## OPSOMMING

'n Gemeenskaps-gebaseerde groeimoniteringsprojek is tot stand gebring in 'n landelike gebied in KwaZulu-Natal. Die projek is 'n voorbeeld van gemeenskapsgebaseerde aktiwiteite wat gebaseer was op 'n deelnemende benadering van probleem bepaling en analise. Die eerste fase van die studie was a situasie analise. Die doel was om die voedingstatus en verwante faktore van kinders 5 jaar en jonger te bepaal. Dit het 'n dwarsnit opname (vraelys en antropometriese metinge), fokus groep besprekings en onderhoude met kern persone ingesluit. Uit 'n voedingsoogpunt het die situasie analise 'n behoefte vir gereelde groeimonitoring van babas en klein kinders, vehoogde beskikbaarheid van voedsels ryk in mikronutriente and voedingsvoorligting aangedui.

Toepaslike bevindinge van die situasie analise was gebruik tydens 'n beplannings werkswinkel wat deur verteenwoordigers van die gemeenskap bygewoon is. Die gemeenskap se besorgdheid oor die gesondheid van voorskoolse kinders en die gebrek aan gesondheidsfasiliteite, asook hul behoefte om hul kinders gereeld te laat weeg, het aanleiding gegee tot die totstandkoming van 'n gemeenskaps-gebaseerde groeimoniteringsprojek.

Die program is gedryf deur monitors deur tuisgebaseerde sentrums (genoem *Isizinda*). Maandelikse aktiwiteite by die *Isizinda* het groeimonitering, voedingvoorligting en die insameling van morbiditeit en mortaliteit inligting ingesluit. Kinders wie mediese sorg benodig het of wie groeivertraging getoon het, is na die naaste kliniek verwys. Die groeimoniteringsprojek is tydens die laaste helfte van die studie met 'n huishoudelike voedselproduksieprojek geïntegreer en die *Isizinda* het as promosie- en opleidingsentrum vir die landbou aktiwitiete gedien.

Projek aktiwiteite is deurgaans gemonitor deur die bywoningsregister en *Isizinda* leërs deur te gaan, waarnemings en personeel vergaderings. Vergaderings met die gemeenskap (ten minste twee per jaar) het voorsiening gemaak vir wedersydse terugvoering en die aanspreek van vrae en besorgdhede.

Die aanvaarbaarheid van die groeimoniterings aktiwiteite is gemeet in terme van bywoning en persepsies. Die *Isizinda* projek het ongeveer 90% van die kinders gedek, van wie ten minste 60% voldoende gemoniteer is. Die *Isizinda* data het 'n eweredige verspreiding van besoeke oor die verskillende oudersdomgroepe aangetoon. Die *Isizinda* data was ook verteenwoordigend van die gemeenskap. Die bywoningssyfers dui aan dat gemeenskapsgebaseerde groeimonitoring 'n lewensvatbare opsie is vir sifting en voeding

opnames, en as 'n platform vir voedingvoorligting.

Meeste moeders kon die groeikaart interpreteer. Positiewe gedragsveranderinge is in die gemeenskap waargeneem en die *Isizinda* data het 'n geleidelike afname in die voorkoms van diarree getoon.

Die Ndunakazi moeders was waarderend teenoor die *Isizinda* projek as gevolg van 'n beter begrip ten opsigte van die voordele van gereelde groeimonitering. Hulle het 'n gevoel van bemagting uitgespreek ten opsigte van hul verbeterde kennis. Hulle was van mening dat die projek moes voortgaan.

Die *Isizinda* projek het aangetoon dat gemeenskapsgebaseerde groeimonitering die infrastruktuur kan skep vir die ontwikkeling vir kapasiteit vir landbou aktiwiteite binne die gemeenskap. Inligting van die huishoudelike voedselproduksieprojek het aangetoon dat die moeders se kennis ten opsigte van voedings verwante aspekte verbeter kan word deur voedingvoorligting wat gegee word tydens die groeimonitering sessie en dat, as groeimonitering geïntegreer is met landbou aktiwiteite, 'n verbetering in die voedingstatus van die kind verkry kan word. Die *Isizinda* projek val binne die raamwerk van die Geïntegreerde Voedingsprogram en kan die gaping dek in areas waar geen gesonheidsfasiliteite is nie.

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**APPENDIX B**

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**APPENDIX D**

Information sheet for monthly data collection at the *Isizinda*

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Focus group discussions: Maternal attitude in 2001

**APPENDIX F**

Questionnaire: Nutrition monitors' attitude in 2000

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## LIST OF ABBREVIATIONS

ARC	Agricultural Research Council
BMI	Body mass index
CBNP	Community-based Nutrition Programme
CDS	Child development scheme (India)
CHW	Community health worker
cm	centimeter
CRHCP	Community Rural Health Care Project (India)
DOH	Department of Health
DRS	Direct Recording Scale
FAO	Food and Agricultural Organization
GM	Growth monitoring
ICDS	Integrated Child Development Scheme (India)
INP	Integrated Nutrition Programme
km	kilometer
MRC	Medical Research Council
NCHS	National Center for Health Statistics
NGO	Non-governmental organization
NPHCC	Ndunakazi Primary Health Care Committee
NRPNI	Nutritional Research Programme for Nutritional Intervention
ORT	Oral rehydration therapy
PEM	Protein-energy-malnutrition
PHC	Primary health care
RTH	Road-to-Health
SASA	South African Sugar Association
SD	Standard deviation
TINP	Tamil Nadu Integrated Nutrition Program (India)
UBGP	Family Nutrition Improvement Program (Indonesia)
UNICEF	United Nations Children's Fund
WHO	World Health Organization
ZOPP	Objective Orientated Project Planning

## GLOSSARY SPECIFIC TO THE *ISIZINDA* PROJECT

<b>Acceptability</b>	For the purpose of this study, the acceptability of the project was measured in terms of attendance and maternal attitude.
<b>Attendance</b>	For the purpose of this dissertation, the attendance at the <i>Isizinda</i> refers to coverage, attendance ratio, age distribution of children attending the GM sessions, and adequacy in terms of the INP Strategy.
<b>Care</b>	Care refers to the behaviour and practices of caregivers who provide the food, health care, psycho-social stimulation and emotional support necessary for the healthy growth and development of children.
<b>Child contact</b>	One child contact refers to one visit of a child to the <i>Isizinda</i> .
<b>Community participation</b>	Community participation refers to the community's input in decision making processes, two-way communication, management of the project at community level, contribution of resources (eg making their homes available), local staff members, involvement in GM activities, support from village leaders.
<b>Coverage</b>	The coverage ratio is an estimation of the number of age-eligible children in the community who were registered in the project.
<b>Cross-sectional survey</b>	A survey that measures the prevalence of a condition or the determinants of a condition, or both, in a population at one point at time.
<b>Growth chart</b>	A graph that is used to record a child's weight for age in months; a chart used by mothers and health workers to determine the adequacy of weight gain of a child.
<b>Growth faltering</b>	Determined by the direction of growth curve, rather than actual weight-for-age itself; weight decreases for 2-3 consecutive months.
<b>Growth monitoring</b>	The process of weighing a child, plotting the weight, assessing the growth, and providing counselling and motivation for household or community actions to improve
<b>Integrating strategy</b>	Providing activities other than the GM activities at the point of growth monitoring.
<b>Maternal attitude</b>	Maternal attitude refers to the mothers' satisfaction with the project with regards to the mothers' opinions on what they have learned, aspects either liked or disliked, the way the project was run, perceived health benefits, and whether they thought the project was sustainable.
<b>Morbidity</b>	A condition resulting from or pertaining to disease; illness.
<b>Nutrition</b>	Nutrition refers to food intake as well as factors influencing food intake and nutritional status.

# **Chapter 1**

## **GENERAL INTRODUCTION**

## CHAPTER 1

### GENERAL INTRODUCTION

#### 1.1 INTRODUCTORY COMMENTS

In 1995, the Department of Health (DOH) initiated an Integrated Nutrition Programme (INP) with the vision of optimal nutrition for all South Africans. Within the INP, community-based actions should be established, based on a participatory approach of problem assessment and analysis (*INP Strategy*, 1999). There is, however, little clarity how this process will materialise. This dissertation describes an example of a community-based growth monitoring (GM) project that was developed using a participatory approach.

##### *Primary Health Care*

Primary Health Care (PHC) is an integral part of the social and economic development of a country (*Glossary of Health Reform Terms for Translators*, 2000). Within the PHC system, responsibilities for health activities are delegated to nonprofessionals within communities (Nabaro & Chinnock, 1988). The South African government has adopted the PHC approach (*White paper for the transformation of the health system in South Africa*, 1997) and, as a result, community participation will become an essential component of the health delivery system.

##### *Participatory approach*

The participatory approach acknowledges the benefits of a partnership between those with scientific and technical knowledge, and those with personal and cultural knowledge (Davis & Reid, 1999). Community involvement in the planning, implementation and monitoring phases enhances ownership, sustainability and the success of community-based programmes (Arole, 1988; UNICEF, 1990; Aubeil & Samba-Ndure, 1996). Communities must therefore be able to make meaningful decisions (London & Bachmann, 1997). The facilitation of dialogue empowers the communities to be involved in the process of identifying and prioritising goals, and establishing strategies (Courtney *et al.*, 1996) to address, for example, malnutrition.

### ***Nutrition programmes***

The causes of malnutrition are multi-sectoral, embracing food, health and caring practices. Nutrition programmes should be developed within a conceptual framework, through a continuous process of Assessment, Analysis and Action (UNICEF, 1990). Successful nutrition programmes usually combine various nutrition components (UNICEF, 1998) and create an awareness of the nature, causes and consequences of malnutrition. This is often achieved by using GM as an entry point (Iannotti & Gillsepie, 2002).

### ***Growth monitoring***

GM is defined as the regular weighing, plotting and interpretation of a child's growth in order to counsel or take action when abnormal growth is detected with the aim to improve the child's health (Garner *et al.*, 2000). With the shift towards PHC (*White paper for the transformation of the health system in South Africa*, 1997), which includes GM in its core package (*The Primary Health Care Service Package for South Africa*, 2000), and GM being a focus area of the INP (*INP Strategy*, 1999), the role of community-based GM will probably increase.

GM is often the centre piece of many nutrition programmes (Iannotti & Gillsepie, 2002) and it has the potential to create a forum through which various activities can be delivered (Leimena, 1989; Mantra, 1992). The availability of various activities make the weighing sessions more attractive for mothers, and integrating nutrition interventions makes the programmes more cost-effective (Allen & Gillespie, 2001).

The role of *clinic-based* GM has been questioned (Gerein & Ross, 1991; George *et al.*, 1993; Chopra & Sanders, 1997) because of a low coverage (Coetzee & Ferrinho, 1994; Schoeman *et al.*, 2000), a bias towards the younger child (Coetzee & Ferrinho, 1994) and the non-representativeness of clinic attenders (Coetzee & Ferrinho, 1994; Solarsh *et al.*, 1994). Furthermore, clinic staff use most of their time for medical diagnosis and treatment, are more committed to medical than educational tasks (Reid, 1984), and are often too busy to complete the Road-to-Health (RTH) card (Harrison *et al.*, 1998).

Globally there is a shift towards community-based GM and at least three large government programmes, namely in Indonesia (Leimena, 1989), Tanzania (Jeje, 1997) and Thailand (Jerome & Ricci, 1997), use a participatory approach in GM. In large nutrition programmes, GM is often used to build confidence and spur critical improvement in

practices by families, motivate community action, integrate and target health and nutrition services, and raise awareness of health and nutritional problems for policy and advocacy (Griffiths *et al.*, 1996).

### ***Research that is need driven***

The United Nations Children's Fund (UNICEF) has called for low-cost, simple interventions focussing on the poorest, with community involvement *in* health care, rather than professional control *of* health care (cited in Nabaro & Chinnock, 1988). Scientists should take a broader view on scientific research, the focus should move from a clinical approach to research on applied programmes and the research should be need-driven (Swales, 2000). Within the INP, different communities will decide on different actions (*INP Strategy*, 1999). The Medical Research Council (MRC) was requested by the Ndunakazi community, a rural village in KwaZulu-Natal, to assist them to address nutritional problems in the area. This afforded the MRC the opportunity to guide the Ndunakazi community in establishing nutrition activities specific to the area.

## **1.2 AIMS AND OBJECTIVES**

The aim of the research described in this dissertation was to establish, within a conceptual framework of malnutrition and through a process of Assessment, Analysis and Action, a community-based GM project in a rural area that lacked established health facilities.

Specific objectives were to:

- (i) complete a situation assessment to evaluate the nutritional status and related factors of children aged 5 years and younger in the Ndunakazi community
- (ii) use the results of the situation assessment to develop a plan of action
- (iii) describe the community-based GM activities and use the process to bring about activities which could benefit nutritional status; and
- (iv) measure the *acceptability* of the GM activities in terms of attendance and maternal perceptions.

The framework of the project is given in **TABLE 1.1** and the time frame in **FIGURE 1.1**.

### **1.3 ETHICAL CONSIDERATIONS**

The study was approved by the Ethics Committee of the MRC. Written informed consent was obtained from each mother or guardian after she was given a detailed explanation of the purpose of the study.

### **1.4 OUTLINE OF THE DISSERTATION**

An overview of the literature is given Chapter 2. The situation assessment and analysis, and the manner in which the results of the situation assessment were used to decide on a plan of action, are described in Chapter 3. The various activities of the community-based growth monitoring project, as well as its integration with a household food production project, are described in Chapter 4. In Chapter 5, descriptive data of the children attending the growth monitoring activities are summarised, and acceptability in terms of attendance and maternal attitude are described in Chapter 6. A discussion is presented in Chapter 7, and the main findings and recommendations for further research are summarised in Chapter 8. The literature cited in all eight chapters is listed in Chapter 9.

**TABLE 1.1:** The framework for the establishment of the community-based growth monitoring activities in the Ndunakazi village.

	Activity	Purpose
<b>SITUATION ASSESSMENT and ANALYSES</b>	<p><u>Step 1.</u> Establishment of committee</p> <p><u>Step 2.</u> Community meeting</p> <p><u>Step 3.</u> Recruitment of fieldworkers</p> <p><u>Step 4.</u> Situation assessment</p> <ul style="list-style-type: none"> <li>Questionnaire</li> <li>Interviews</li> <li>Focus group discussions</li> <li>Anthropometric measurements</li> <li>Biochemical analysis</li> </ul> <p><u>Step 5.</u> NPHCC meeting</p> <p><u>Step 6.</u> Community meeting</p> <p><u>Step 7.</u> ZOPP-workshop</p>	<p>Channel of communication between MRC and community</p> <p>Sensitise the community</p> <p>Obtain necessary skills for the community-based fieldwork</p> <p>Determine the nutritional status of children</p> <p>Analyse possible causes of malnutrition</p> <p>Determine environmental and economic constraints</p> <p>Report the results of the situation assessment</p> <p>Report the results of the situation assessment</p> <p>To decide on a plan of action</p>
<b>COMMUNITY-BASED GROWTH MONITORING</b>	<p>Growth monitoring</p> <ul style="list-style-type: none"> <li>▸ weighing the child</li> <li>▸ plotting weight on growth chart</li> <li>▸ interpret the growth curve</li> <li>▸ counsel the mother</li> </ul> <p>Referral system to clinic</p> <p>Morbidity data</p> <p>Nutrition education</p> <ul style="list-style-type: none"> <li>▸ promotion of growth monitoring</li> <li>▸ breastfeeding</li> <li>▸ complementary feeding</li> <li>▸ diarrhoea</li> </ul> <p>Management</p> <p>Training</p> <ul style="list-style-type: none"> <li>▸ initial training</li> <li>▸ continuous in-service training</li> </ul>	<p>Measure the growth of the children</p> <p>Create a platform for nutrition activities</p> <p>Children who show growth faltering</p> <p>Facilitate interpretation of the growth curve and counselling</p> <p>Monitoring health situation in the community</p> <p>Promote sound nutrition practices</p> <p>Effective operation of the project</p> <p>Obtain necessary skills</p>
<b>INTEGRATED ACTIVITY</b>	<p>Household food production project</p> <ul style="list-style-type: none"> <li>▸ demonstration garden</li> <li>▸ food preparation</li> <li>▸ education regarding vitamin A</li> </ul>	<p>To improve the vitamin A status of the children</p> <p><u>The role of GM:</u> The community-based growth monitoring points served as training centres for the agricultural activities and were used as platform to promote the production and consumption of dark-green leafy and yellow vegetables</p>
<b>MONITORING</b>	<p>Monthly visits by project leader</p> <ul style="list-style-type: none"> <li>▸ attendance register</li> <li>▸ <i>Isizinda</i> register</li> <li>▸ observation</li> <li>▸ staff meeting</li> </ul> <p>Community meetings</p>	<p>Monitor the progress of the project; problem solving</p> <p>Feedback; problem solving</p>
<b>EVALUATION</b>	<p>Attendance</p> <ul style="list-style-type: none"> <li>▸ coverage, attendance ratio, age-distribution, adequacy</li> </ul> <p>Maternal attitude</p> <ul style="list-style-type: none"> <li>▸ focus group discussions</li> </ul>	<p>Measure the acceptability of the project</p>

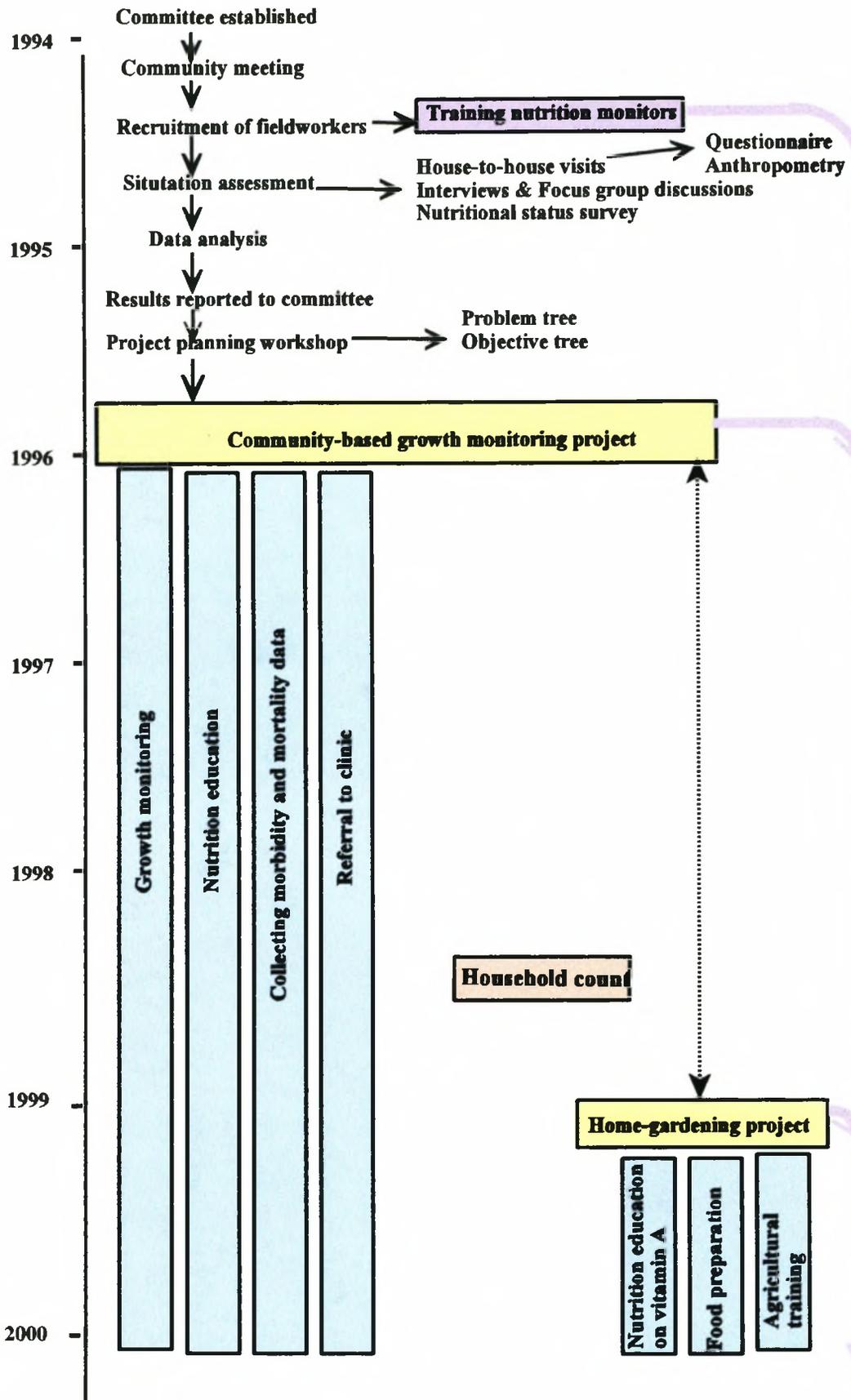


FIGURE 1.1: The time frame of the study.

# **Chapter 2**

## **REVIEW OF THE LITERATURE**

## CHAPTER 2

### REVIEW OF THE LITERATURE

#### 2.1 MALNUTRITION IN SOUTH AFRICA

It is estimated that half of South Africa's population of 40.5 million (Udjo & Lestrade-Jefferis, 2000) lives in poverty. Most of the poor live in rural areas; 45% of the total population is rural, but rural areas contain 72% of those members of the total population who are poor (Government Communications, 1998). Poverty results in hunger and malnutrition. Malnutrition is one of the biggest contributors to child morbidity and mortality, and has been identified as a priority area (Shung-King *et al.*, 2000). Infant mortality rate is considerably higher in rural areas as compared to urban areas (SADHS, 1999).

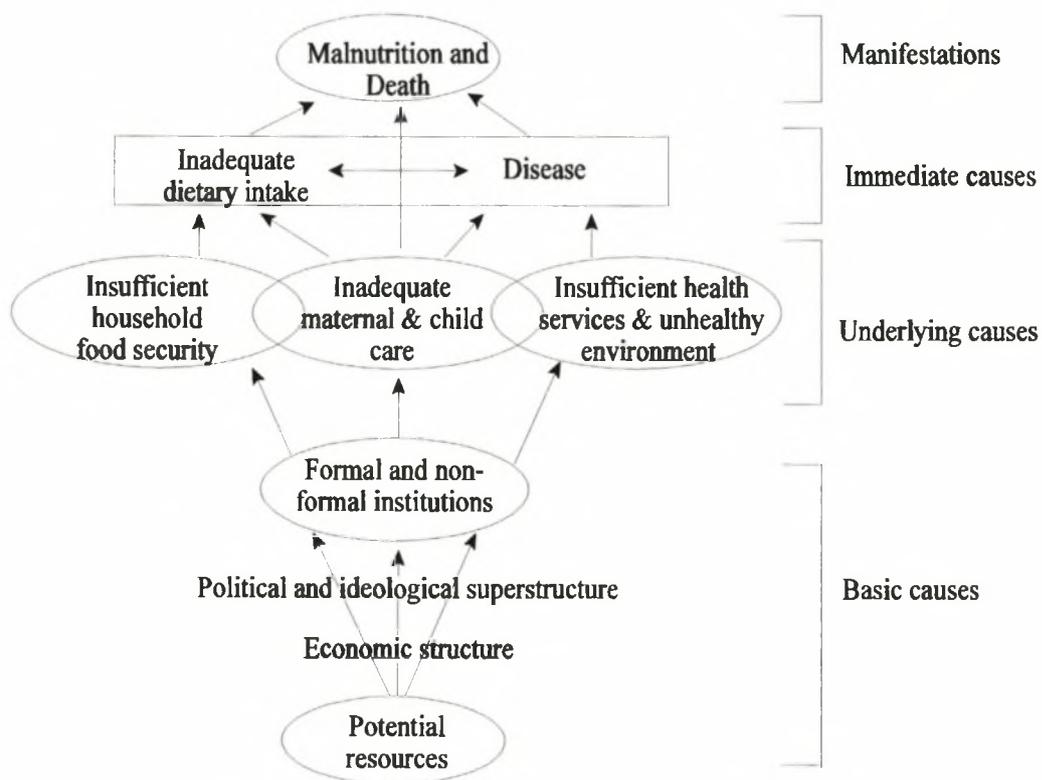
According to the national survey of the South African Vitamin A Consultative Group (1996), 23% of children aged 6-71 months are stunted, an indicator of chronic malnutrition, and 9% are underweight. Five years later, a national food consumption survey (Labadarios *et al.*, 2001) showed similar results. Both surveys showed rural children to be the most severely affected and maternal education to be an important determinant for anthropometric indicators of malnutrition (South African Vitamin A Consultative Group, 1996; Labadarios *et al.*, 2001).

Data suggest that growth faltering sets in during the weaning period (Oelofse *et al.*, 1999). In low socio-economic communities, complementary foods are introduced early in life (Ross *et al.*, 1983; Ransome *et al.*, 1988; Delpont *et al.*, 1997; Faber *et al.*, 1997) and exclusive breastfeeding is not practised widely (Ransome *et al.*, 1988; Faber & Benadé, 1999; Schoeman *et al.*, 2000). In rural areas, porridge made with maize meal is often given as the first complementary solid food (Faber *et al.*, 1997), and a diet low in energy, poor in protein quality, and deficient in micronutrients has been reported for children under the age of 2 years (Faber & Benadé, 2001). In various areas of the country the bulk of the diet of preschool children is porridge made with maize meal, and bread (Steyn *et al.*, 1993; Faber *et al.*, 2001a).

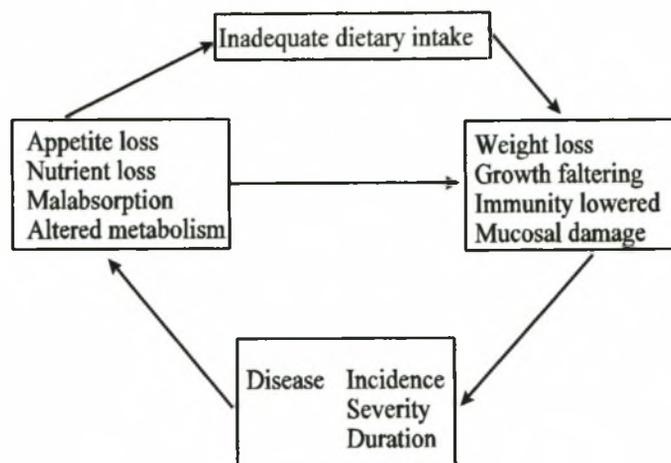
In 1995, a meta-analysis of quantitative dietary surveys showed that dietary intakes of black children were low in energy and micronutrients (Vorster *et al.*, 1997). In 1999, a national food consumption survey showed that the great majority of children aged 1-9 years consumed a diet deficient in energy and of poor nutrient density. The nutrient intake of children in rural areas was considerably poorer than that of children in urban areas. At national level, energy intake correlated significantly with stunting (Labadarios *et al.*, 2001).

## 2.2 CONCEPTUAL FRAMEWORK FOR CHILD MALNUTRITION

The relationship between food intake and malnutrition is complex, as indicated in UNICEF's conceptual framework for child malnutrition (FIGURE 2.1). The framework shows that the causes of malnutrition are multi-sectoral, embracing food, health and caring practices. Child malnutrition is a result of immediate (individual level), underlying (household level) and basic (societal level) causes, whereby factors at one level influence other levels. The mutually reinforcing interaction between the two immediate causes (inadequate dietary intake and diseases) is shown in FIGURE 2.2.



**FIGURE 2.1:** The conceptual framework for child malnutrition (UNICEF, 1990).

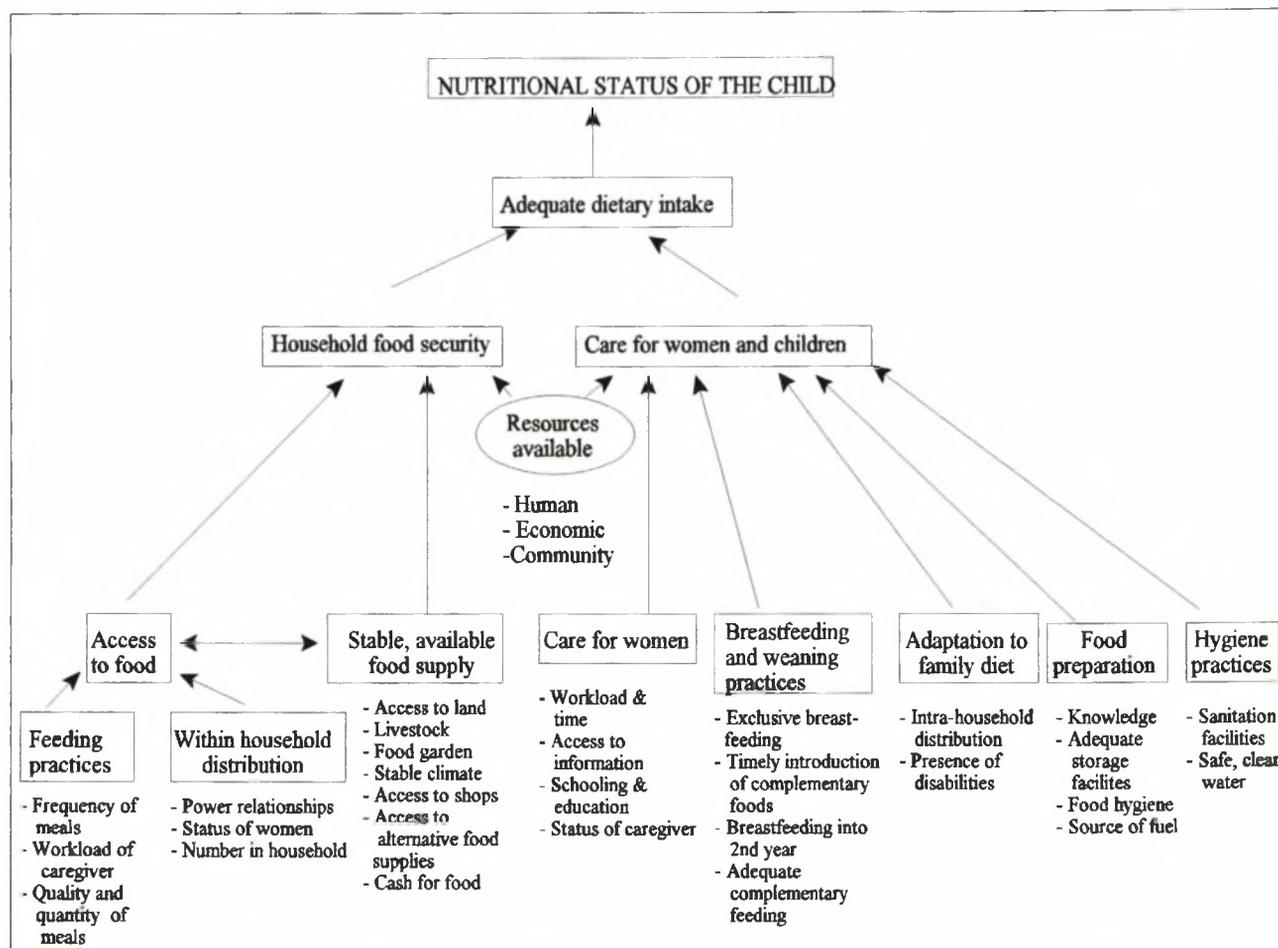


**FIGURE 2.2:** The mutually reinforcing interaction between inadequate dietary intake and disease (Tomkins & Watson (1989).

Household food security, adequate care for children and women, and access to basic health services, together with a healthy environment, are necessary for nutritional well-being. Both household food security and health care services include aspects of availability, accessibility and affordability. The underlying causes of child malnutrition are affected by the availability, accessibility and use of human, economic and organisational resources, which are a result of previous and current political, social, and cultural factors (UNICEF, 1990). It is clear that sectors other than health, like agriculture, education, social welfare, and community development, can play an equally important part in the control of malnutrition. Strategies to combat malnutrition should address the immediate, underlying and basic causes. Support to deliver services (e.g. feeding programmes) addresses primarily the immediate and some of the underlying causes; capacity building (e.g. training) aims at a more efficient use of existing resources; and empowerment (e.g. income generation) aims at increasing the availability and control of resources (Johnson, 1995).

*To give fish to a poor person is service delivery;  
to teach the person how to fish is capacity development;  
to ensure access to a river or lake is empowerment*  
(Johnson, 1995)

The conceptual framework for malnutrition is flexible and can be modified to focus on local conditions. Factors determining an adequate dietary intake for children in South Africa, based on the conceptual framework, are shown in **FIGURE 2.3**. Non-dietary factors have been shown to be associated with the nutritional status of the young child (Krige & Senekal, 1997; Faber & Benadé, 2000), and from **FIGURE 2.3** it is clear that malnutrition can be addressed through measures which are not regarded as conventional nutritional activities, such as control of diarrhoeal disease, provision of safe water and better environmental sanitation.



**FIGURE 2.3:** Factors determining adequate dietary intake in children, based on the UNICEF framework and modified to the South African context (Steyn, 2000).

### 2.3 CARING CAPACITY OF MOTHERS

Nutritionally, care encompasses all measures and behaviours that translate available food and health resources into good child growth and development (UNICEF, 1998). Caring capacity can be described as "the ability to perform care behaviours, to use human, economic, and

organisational resources to the benefit of infants and young children". Caring also refers to the way an act is performed, for example with warmth and affection, and not just the act itself (Van Esterik, 1995).

Within the UNICEF conceptual framework it is recognised that care, in addition to food security and access to health care services, is critical for optimal child growth and development. Evolving from the UNICEF nutrition strategy (UNICEF, 1990), a conceptual framework (FIGURE 2.4) describing the various factors that influence the quality of care and how care itself influences nutritional status was developed at Cornell University and presented to UNICEF in 1993 (Ramakrishnan, 1995).

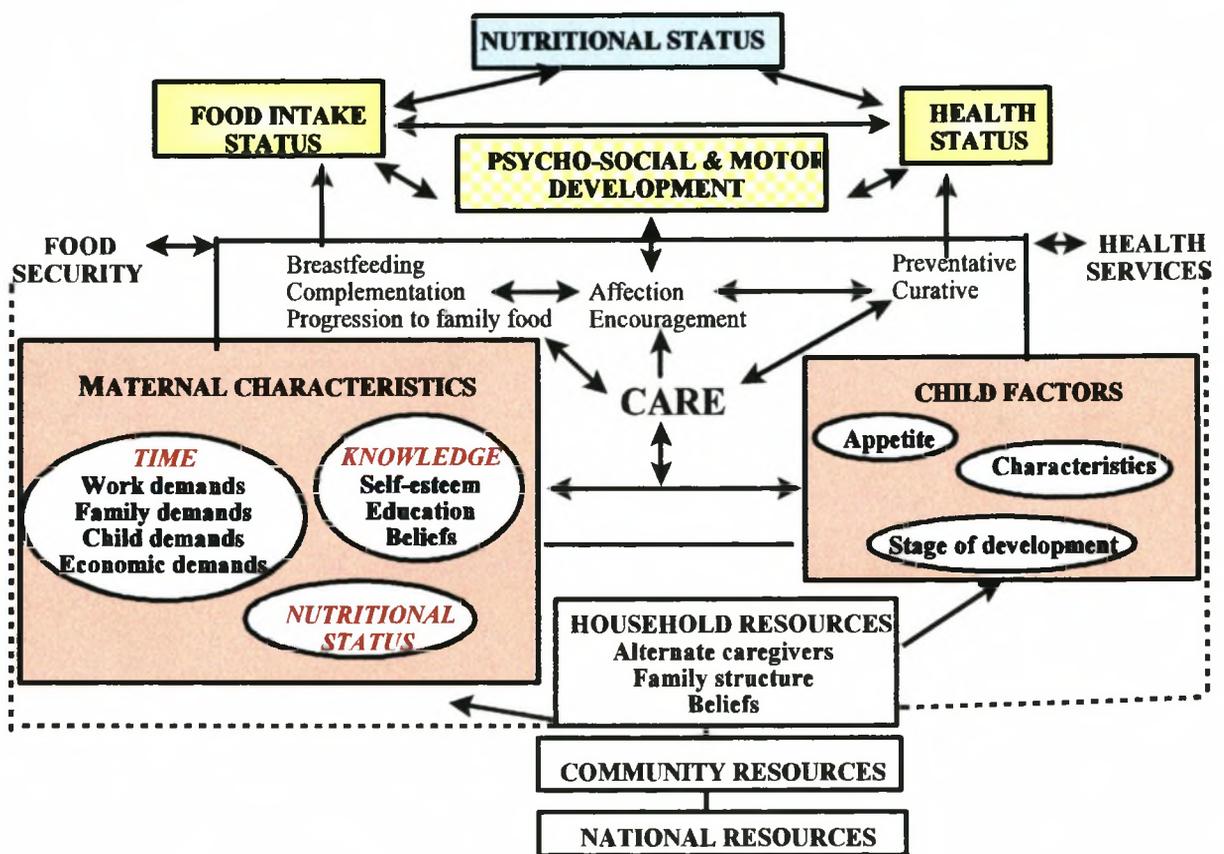


FIGURE 2.4: Conceptual framework for care and child nutrition (Ramakrishnan, 1995).

In 1997, as part of a Care Initiative, UNICEF identified six care practices that are required for the growth and development of children younger than 3 years. These care practices are (i) feeding practices, which includes breastfeeding and complementary feeding; (ii) psycho-social care, which includes warmth, verbal interaction and encouragement of learning; (iii) home

health practices, which include diagnosis of illness in the home, preventative health care, protection from pests, and prevention of accidents; (iv) care of women, which includes adequate prenatal care and safe delivery, and equal access to education; (v) food preparation; and (vi) hygiene practices (Engle *et al.*, 1997). Care practices can be influenced by the caregiver's (i) knowledge, education and beliefs; (ii) health and nutritional status; (iii) mental health, lack of stress, and self-confidence; (iv) autonomy and control of resources; (v) workload and time constraints; and (vi) social support received from family and the community (Engle *et al.*, 1996).

### 2.3.1 Care practices

#### (i) Feeding practices

Breastfeeding contributes to care by fostering mother-infant bonding. Breastfeeding has a protective effect on diarrhoeal disease in infancy and early childhood (Mulder-Sibanda & Sibanda-Mulder, 1999). During the first six months, failing to initiate breastfeeding or ceasing to breastfeed can increase the rate of diarrhoeal mortality 8- to 10-fold. The risk of mortality associated with not breastfeeding is greater for low birth weight infants and infants whose mothers had little formal education (Yoon *et al.*, 1996). In Chili, breastfed infants have a better nutritional status than bottle fed infants (Castillo *et al.*, 1996). In Guinea-Bissau, diarrhoea was not associated with socio-economic or environmental variables, or maternal education, as long as the child was being breastfed, whereas strong associations were observed in fully weaned children (Mølbak *et al.*, 1997). After the age of 6 months, there is a dramatic drop in the protective effect of breastfeeding (Yoon *et al.*, 1996).

The effect of prolonged breastfeeding on nutritional status is not yet clear. A possible explanation for conflicting findings is the observation that overall weaning practices differ greatly between regions. Caulfield *et al.* (1996) explained one of these differences as "in Sub-Saharan countries the biggest children are weaned first, and in non-Sub-Saharan countries the smallest children are weaned last".

There are indications that, particularly among malnourished children, prolonged breastfeeding is associated with a higher likelihood of survival (Fawzi *et al.*, 1997a). In a Chinese population in which food was introduced late in infancy, prolonged breastfeeding was associated with improved nutritional status (Taren & Chen, 1993). In Bangladesh, where

nearly half of the children between 24-36 months were still being breastfed, breastfeeding was associated with a substantial reduction of the risk of vitamin A deficiency (Mahalanabis, 1991). In Tanzania, early cessation of breastfeeding was identified as a major cause for child malnutrition (Serventi *et al.*, 1995).

In some cases, however, prolonged breastfeeding is associated with an increased risk of malnutrition (Ng'andu & Watts, 1990). In Ghana, children breastfed for longer than one year had a lower nutritional status than fully weaned children (Nube & Asenso-Okyere, 1996). There are indications that the inverse association between prolonged breastfeeding and nutritional status is not causal (Fawzi *et al.*, 1998), but may be the result of the poor quality of complementary foods (Ng'andu & Watts, 1990). It has been shown that complementary foods given to breastfed children are of lower nutritional value as compared to the foods given to fully weaned children (Fawzi *et al.*, 1997b). The poor quality of complementary foods in poor countries is illustrated in a study which compared the growth of affluent breastfed infants in the United States (US) with a group of poor infants from Peru. Compared with the US infants, those from Peru started faltering after 6 months of age, although both groups had comparable milk volume and density. The infants from Peru, however, received less energy and protein from non-breast milk sources at 9-12 months of age than the US infants (Dewey *et al.*, 1992). Similar findings were reported in India, where infants of low socio-economic status were compared to infants of high socio-economic status (Rao & Rajpathak, 1992).

In Kenya, in 12-36 month old children, diet diversity, and not breastfeeding, was strongly associated with nutritional status (Onyango *et al.*, 1998). Poor complementary feeding practices can be ascribed to a lack of knowledge, poor handling of food, and inadequate quantities (Rao & Rajpathak, 1992). Eating cold left overs is also a risk factor for diarrhoeal disease (Mølbak *et al.*, 1997).

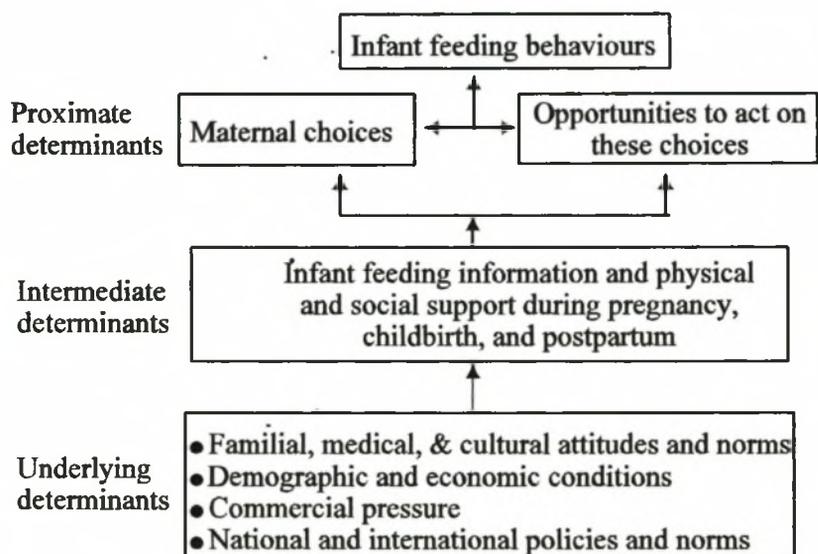
It has been suggested that when breastfeeding is continued during the first year of life and adequate complementary feeding is ensured, if growth faltering occurs it is probably attributable to prenatal factors and maternal stature (Dewey, 1998).

The duration of breastfeeding is often shorter in mothers who work (Bouvier & Rougemont, 1998). Compared to breastfed children in the care of caregivers, breastfed children who are cared for by their mothers are probably breastfed more frequently, resulting in a lower prevalence of diarrhoea (Mølbak *et al.*, 1997).

Early introduction of complementary foods (solids or liquids) is likely to reduce the

infant's demand for breast milk, and will interfere with the maintenance of lactation, ending with early termination of breastfeeding. The introduction of complementary foods too early increases the risk of diarrhoea because of contamination of the bottles and food (Brown *et al.*, 1989; Popkin *et al.*, 1990).

Constraints to improving feeding practices can be classified as environmental and attitudinal. *Environmental constraints* include the unavailability or seasonal variability of certain foods; the need to work outside the home which decreases time available for food preparation and feeding; scarcity of cooking fuel; and communication of misinformation by health workers about child feeding. *Attitudinal constraints* include perceptions, beliefs, and taboos related to feeding (Dickin *et al.*, 1997). Infant feeding behaviours are the end result of proximate, intermediate and underlying determinants as shown in **FIGURE 2.5**.

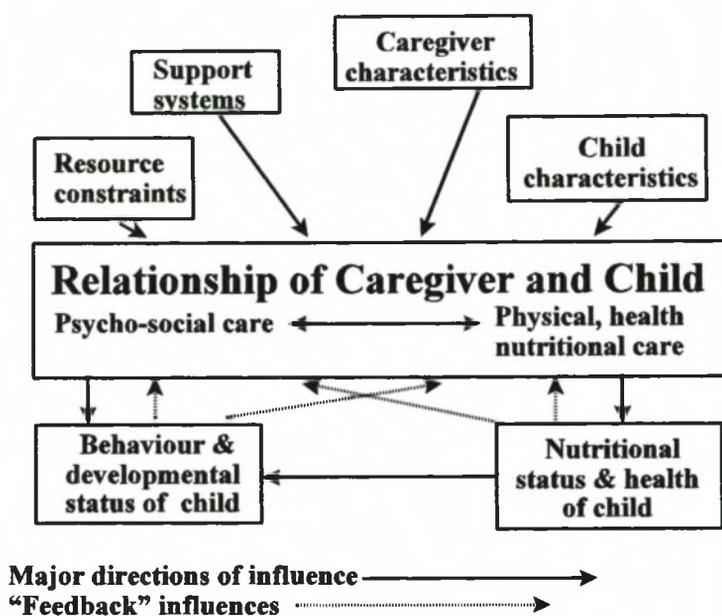


**FIGURE 2.5:** Determinants of infant feeding behaviours. (ACC/SCN, 2000)

## (ii) Psycho-social care

The psycho-social aspects of care are as important as the more physical caring behaviours such as, for example, feeding. Psycho-social care refers to the caregiver's responsiveness and sensitivity, affection and warmth, psychological involvement with the child, and encouragement of learning and development (Engle & Ricciuti, 1995). Responding to a child's need for care through talking, playing and providing a stimulating environment has been

identified as a key practice to improve child health and nutrition (*Reaching Communities for Child Health and Nutrition*, 2001). From **FIGURE 2.6** it is clear that the relationship between the child and the caregiver and the quality of psycho-social care that the caregiver can provide depends on various factors through a continuous series of interactions.



**FIGURE 2.6:** Factors that affect the relationship of the caregiver and the child (Engle & Ricciuti, 1995).

The importance of psycho-social care was illustrated in studies that showed that less vocal and less alert infants received less vocalisation from their mothers (Rahmanifar *et al.*, 1993), and that verbal and cognitive stimulation of undernourished children resulted in higher growth rates compared to children without such stimulation (Grantham-McGregor *et al.*, 1991). Engle and Lhotska (1999) reviewed the literature on care practices and concluded that programmes that include aspects of care are likely to be effective in increasing nutrient intake and improving growth and development of children from birth to 3 years of age.

**(iii) Home health practices**

Poor household sanitation (Rahmanifar *et al.*, 1996), the use of unsafe water (Islam *et al.*, 1994), the presence of flies around the house (Khin-Maung *et al.*, 1994) and unhygienic latrines (Islam *et al.*, 1994; Khin-Maung *et al.*, 1994) were shown to be associated with infections and malnutrition. A review of 67 studies from 28 countries showed that sanitation

and improved water supply reduced morbidity (Esrey *et al.*, 1985), with improved sanitation having the greater impact (Esrey & Habicht, 1986).

### **2.3.2 Influencing factors**

#### **(i) Maternal education**

Data from Ghana suggest that care practices are associated with the nutritional status of the young child, only for mothers with primary or less education; not for mothers with secondary education (Ruel *et al.*, 1999). Low levels of maternal education are associated with malnutrition in children (Islam *et al.*, 1994; Khin-Maung *et al.*, 1994; Rosen *et al.*, 1994); also in South Africa (South African Vitamin A Consultative Group, 1996; Labadarios *et al.*, 2001). Women with minimal formal education are less likely to have access to information about nutrition, and it has been argued that illiterate mothers are less able to understand health education messages (Islam *et al.*, 1994). During the past decade, improving women's education and social status emerged as a central theme for reducing childhood malnutrition (LaForce *et al.*, 2001).

#### **(ii) Poverty**

Poverty (Ng'andu & Baboo, 1990) and a lack of resources (Waihenya *et al.*, 1996) can prevent mothers from applying their knowledge. Focussed counselling can, however, improve practices that require no financial needs, such as breastfeeding practices (Davies-Adetugbo *et al.*, 1997). The poorer the environment, the more important the role care has in child survival, growth and development (Engle *et al.*, 2000). Islam *et al.* (1994) argued that poverty not only limits the ability of better child-care, but also contributes to maternal malnutrition.

#### **(iii) Maternal health and nutritional status**

Maternal malnutrition is often associated with child malnutrition (Islam *et al.*, 1994), and well-nourished mothers have healthier children (Rahman *et al.*, 1993). Maternal nutrition before and during pregnancy is associated with birth weight and infant growth up to the age of 6 months (Fawzi *et al.*, 1997c). Low maternal dietary intake of animal foods and certain B vitamins during lactation is associated with infant drowsiness (Rahmanifar *et al.*, 1993).

The mother's nutritional status can influence her caring behaviour (McCullough *et al.*,

1990). Poorly nourished mothers interact less with their infants (Rahmanifar *et al.*, 1993) and mothers who are ill often breastfed for a short duration (Jakobsen *et al.*, 1996).

#### **(iv) Marital status**

The marital status of the mother or caregiver can influence the child's well-being. Children from single or formally married mothers (Gage, 1997) and children in the care of widowed caregivers (Faber & Benadé, 2000) are at risk for malnutrition. In Ghana, the level of per capita consumption is substantially lower in households headed by divorced and widowed women than in those headed by married women (Lloyd & Gage-Brandon, 1993).

#### **(v) Maternal emotional well-being**

The mother's emotional well-being can influence the quality of care she can provide. Caregivers who are satisfied with their family life (Faber & Benadé, 2000) and mothers who are rated as "happy" (Zeitlin, 1994; Range *et al.*, 1997) have the best nourished children.

#### **(vi) Birth interval**

A short preceding birth interval is detrimental for child survival in the first four months of life (Kuate Defo, 1997). Children born at home (Faber & Benadé, 2000) and children with many siblings are at risk of malnutrition (Kjohlhede *et al.*, 1995).

## **2.4 PRIMARY HEALTH CARE SERVICES IN SOUTH AFRICA**

The South African government is committed to comprehensive PHC. In the *White Paper on the Transformation of the Health System in South Africa* (1997) PHC is defined as the "provision of preventive, promotive, curative and rehabilitative care". PHC is an integral part of the social and economic development of a country (*Glossary of Health Reform Terms for Translators*, 2000). Key principles are that those most in need are covered, and that communities are given more power and responsibility, with health professionals having less control and authority (Nabaro & Chinnock, 1988). A core package of PHC services for South Africa has been proposed. For children, it makes provision for a comprehensive package of services to be provided at a primary level through mobile clinics, fixed clinics and community health centres. The package includes, among others, health promotion and prevention

activities; immunisation; developmental and genetic screening; and GM (*The Primary Health Care Service Package for South Africa*, 2000). Although concerns have been raised (Chopra *et al.*, 1998), one of the strengths of the proposed core package is the involvement of communities (Rothberg & Pettifor, 1998). With the adoption of the PHC approach to extend health services to the entire population, community participation becomes an essential component of health delivery.

GM is to play a central role in the strategy to fight malnutrition. For regular GM people must have access to PHC facilities. Mothers usually find it difficult to adhere to regular GM schedules, even more so in areas with inadequate provision of health services. GM at some health facilities is hampered by a lack of equipment. A national survey on PHC facilities showed that 6.3% of clinics did not have baby scales; in the Northern Cape it was as high as 16.7% (Viljoen *et al.*, 2000). A situation analysis of health care services carried out in 1994 showed that, considering the rapid population growth, 230-315 clinics should be built per year to fulfil the recommendation of the World Health Organization (WHO) of one clinic per 10 000 people by the year 2000 (Chetty, 1995). This target could not be reached, and even in 1997, when an active clinic-building programme was embarked on, only 204 clinics were built (*Stats in Brief*, 2000). Basic infrastructure does not meet acceptable standards for a significant number of clinics and in two provinces more than 80% of the clinics are in need of major repair (Fonn *et al.*, 1998). Clinics are seldom built to serve small communities. Instead, mobile clinics are widely used to provide PHC services to small towns and rural areas. The travelling costs of providing services through mobile clinics are high, and people are often unwilling to wait outside at busy, infrequent mobile points. Cost analysis suggests that small part-time clinics within communities could be more cost-effective than mobile clinics (Dyer, 1996). Cost-effective, acceptable ways of either delivering or complementing PHC services, especially in rural areas, should be sought.

## **2.5 THE INTEGRATED NUTRITION PROGRAMME**

In 1995, the DOH initiated the INP to address and prevent malnutrition with the vision of optimum nutrition for all South Africans. The INP targets nutritionally vulnerable communities, groups and individuals, with children under 5 years of age and at-risk pregnant and lactating women as the priority target groups. The comprehensive approach addresses the

underlying socio-economic, environmental, educational and health related causes of malnutrition through **direct**<sup>1</sup> and **indirect**<sup>2</sup> nutrition interventions, and includes service delivery as well as behaviour change aspects. Within the INP, an interactive and participatory process of problem assessment and analysis, followed by action, should be adopted at all levels. The intervention decided upon depends on the findings of the situation assessment and analysis, as well as the availability of resources (*INP Strategy*, 1999; INP, 2002).

Within the INP there are three sub-divisions, namely, (i) health facility-based nutrition programme, (ii) community-based nutrition programme (CBNP), and (iii) nutrition promotion programme. Integral to the CBNP are community participation, community-based initiatives, and capacity building within communities. Communities should become self-sufficient regarding food and nutritional needs, and should be empowered to protect and improve the health and nutrition of young children and women. At community level, appropriate actions should be defined and implemented for a specific community. Although actions in different communities may differ, the aim should always be to reach those most in need with the goal to improve child nutrition and health (*INP Strategy*, 1999). The principles on which the INP are based, as well as the focus areas, purpose and support systems of the INP, are summarised in **TABLE 2.1**.

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<sup>1</sup> For example, nutrition education and promotion; micronutrient supplementation; food fortification; and disease-specific nutrition counselling and support.

<sup>2</sup> For example, provision of health care services; agricultural production; parasite control; and provision of clean safe water.

**TABLE 2.1:** The principles on which the Integrated Nutrition Programme are based, as well as the focus areas, purpose and support systems at national level.

- PRINCIPLES ON WHICH THE INP IS BASED**
1. Good nutrition for all South Africans should be promoted as a basic human right and as an integral component and outcome measure of the country's social and economic development;
  2. nutrition programmes should be integrated, sustainable, environmentally sound, people- and community-driven;
  3. there should be a clear strategy for promotion of nutritional well-being and the nutritional status of the population must be monitored;
  4. nutrition policies, strategies and programmes are dependent on the development of human and institutional capacities and the provision of adequate financial resources;
  5. existing structures and programmes should be used to address nutritional concerns; and
  6. an integrated PHC approach, which includes monitoring to generate useful information for better targeting of services, should be adopted.

FOCUS AREA	PURPOSE
Disease-specific nutrition support, treatment and counselling	Contribute to the prevention and reduction of morbidity and mortality rates due to malnutrition, nutrition-related diseases of lifestyle, communicable and infectious diseases and debilitating conditions.
Growth monitoring and promotion	Contribute to optimal growth of infants and young children.
Nutrition education, promotion and advocacy	Improve nutritional knowledge, behaviour, perceptions and attitudes of the population.  Sensitise policy- and decision-makers as well as other relevant decision makers on nutrition.
Micronutrient malnutrition control	Eliminate micronutrient deficiencies among the population, focussing on vulnerable groups.
Food service management	Contribute to institutional care of clients.
Promotion, protection and support of breastfeeding	Contribute to child survival and mother's health.
Contribution to household food security	Contribute to the improvement of household food security through advocacy, technical support and nutritional advice to other sectors dealing with household food security.

**SUPPORT SYSTEMS**

Human resources plan

Nutrition information system: nutrition surveillance; nutrition surveys; management information system

Financial and administrative system

*(Integrating Nutrition into Health and Development Programmes, 2000; INP, 2002).*

One of the aims of the INP is to contribute to optimal growth of infants and young children through GM and promotion. The aim is to establish and strengthen sustainable GM practices, firstly at health facilities and, secondly, in communities. Within the health facility-based component of the INP, GM should be the centre of all nutrition intervention programmes. Children should be growth monitored from birth, and outreach strategies should be developed to ensure that all children younger than 6 years in the catchment area of a health facility are growth monitored according to the GM schedule as summarised in **TABLE 2.2**. A system to identify and trace defaulters must be put in place (*INP Strategy, 1999*).

**TABLE 2.2:** Schedule for growth monitoring, as described by the Integrated Nutrition Programme.

<b>Age of the child</b>	<b>Recommended frequency</b>
<b>0-24 months</b>	monthly if progress is satisfactory more frequently if child is faltering in growth
<b>24-60 months</b>	three-monthly if growth is satisfactory more frequently if child is growth faltering
<b>Minimum growth monitoring</b>	0 - < 12 months: five times per year 12 - < 24 months: four times per year 24 - < 60 months: three times per year

(*INP Strategy, 1999*)

Specific guidelines for GM were developed (*Integrated Case Management Guidelines, 1999*). Briefly, the weight of the child must be plotted on the clinic card and the growth curve and implication thereof must be explained to the mother. A growth curve that (i) rises in the same direction as the reference curve indicates normal growth, (ii) is slowing down, flat or falling for 2-3 consecutive monthly visits indicates growth faltering, and (iii) rises faster than the reference curve indicates either catch-up growth or overfeeding. If the child is growing well, the mother should be encouraged. When growth faltering occurs, a specific plan of action must be followed according to specific guidelines (*Guidelines for the management of a child underweight for age or growth faltering, 1999*). For effective GM practices, health and nutrition staff must be trained in weighing, plotting the weight, interpreting the growth curve and suggesting appropriate actions in consultation with the mother. During these GM sessions, questions should be asked regarding illnesses and feeding practices, and the immunisation status of the child must be checked (*INP Strategy, 1999*).

## 2.6 GROWTH MONITORING

Anthropometry is universally accepted as the most useful tool for assessing the nutritional status and risk of poor health and survival of infants and young children (Allen & Gillespie, 2001). Because most forms of child malnutrition result in growth faltering, GM can provide important information about child nutrition. GM is a powerful tool to protect child nutrition and empower communities (UNICEF, 1998).

The concept of GM originated in the 1960s when Morley and colleagues, working in Nigeria, realised the potential of regular weight measurements in situations where small children were seen regularly (Cuthbertson & Morley, 1962). In the 1970s, GM was introduced in various child health care activities in developing countries. During that time, Morley pioneered the development of the Road-to-Health (RTH) card (Morley & Woodland, 1979). In the 1970s the WHO published recommendations for growth reference values, the design of the growth chart and guidelines for its use (WHO, 1978). UNICEF included GM in their strategies to improve children's health and several governments incorporated GM strategies into their health care strategies (Gwatkin *et al.*, 1980). In 1990, the World Summit for Children called for institutionalising growth promotion and regular GM in all countries by the year 2000 (United Nations, 1990). Although progress has been made in this regard, a shortcoming of most of the approaches used is that GM information is often not used for family, community or government action (UNICEF, 2002). In South Africa, GM is one of the focus areas of comprehensive child health care (*INP Strategy*, 1999).

When anthropometric data is used for the assessment of nutritional status, the measurements should be reported in relation to a reference population whose growth patterns are unconstrained by environmental factors (Beaton *et al.*, 1990). Usually the reference population defined by the United States National Center for Health Statistics (NCHS) (Hamill *et al.*, 1979) is used to generate indices for malnutrition, namely, height-for-age, weight-for-age and weight-for-height. GM programmes focus on adequate weight gain, rather than nutritional status, using the NCHS growth curve as reference (Griffiths *et al.*, 1996).

As compared to height, weight fluctuates relatively rapidly with changes in health status or dietary intake (Griffiths *et al.*, 1996). Weight is a sensitive indicator of a child's growth, and growth failure is an *early* indicator of ill-health in young children that can be caused by various factors (e.g. dietary malnutrition, infections, emotional deprivation) (Jelliffe

& Jelliffe, 1989). As compared to height-for-age, weight-for-age is a more useful indicator to be used for GM, as it reflects current malnutrition and is sensitive to small changes. Actions can therefore be taken before severe malnutrition sets in. On the other hand, height-for-age, which is an indicator of long-term malnutrition, is not sensitive to small changes and will therefore not be able to detect early growth faltering (Wilson *et al.*, 1986; Gorstein *et al.*, 1994).

GM is defined as the regular measuring, plotting and interpretation of a child's growth in order to counsel or take action when abnormal growth is detected with the aim to improve the child's health (Garner *et al.*, 2000). In some cases, as in the INP (*INP Strategy*, 1999), the term "growth monitoring and promotion" is used to emphasise the need to use the information for promoting better growth. It is, however, recognised that weighing and charting alone cannot improve growth, and, therefore, by definition, GM should include counselling and action to improve nutrition (Griffiths *et al.*, 1996). The various components of the GM process, within the context of the triple-A approach (section 2.8; **FIGURE 2.11**) are indicated in **TABLE 2.3**.

**TABLE 2.3:** The components of the growth monitoring process.

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Regular measurements of child growth ( <i>Assessment</i> )
<ul style="list-style-type: none"> <li>• weighing the child</li> <li>• graphing the weight for the age of the child on a growth chart</li> <li>• interpreting the adequacy of weight gain</li> </ul>
Decision-making and action needed ( <i>Analyse</i> )
<ul style="list-style-type: none"> <li>• talking to the caretaker to determine the causes of problems or the reasons for success</li> <li>• tailored counselling; referral to available services</li> </ul>
Decision-making and action at household, community and programme level ( <i>Action</i> )
<ul style="list-style-type: none"> <li>• integrate and target services and resources to motivate and enhance actions in the household</li> </ul>
Follow-up / feedback on the effects of the actions taken ( <i>Re-assessment</i> )
<ul style="list-style-type: none"> <li>• household level - individual children</li> <li>• community / programme level - all children</li> </ul>

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Adapted from Valyasevi *et al.*, 1995 and Griffiths *et al.*, 1996

The role of GM can be divided into at least four broad strategies, namely (i) as a screening tool, (ii) for education and promotional purposes, (iii) for nutrition surveillance, and (iv) as an integration strategy (Ruel, 1995). A summary of the purpose of GM and the mechanisms by which they are expected to lead to action within these four strategies is given in **TABLE 2.4**.

**TABLE 2.4:** The purposes of growth monitoring and the mechanisms by which they are expected to lead to action.

<b>Purpose</b>	<b>Mechanism</b>	<b>Action</b>
<b>SCREENING</b>		
For individuals	Identification of at-risk children	Counselling; nutritional supplementation; treatment of concurrent diseases such as diarrhoea; referral to health facility for investigation and diagnosis
<b>EDUCATION and PROMOTION</b>		
For individuals, communities, governments, policy-makers	Increased knowledge, interest, awareness, motivation, and commitment	Better management of health and nutritional problems Ability to: Assess the nature of the problem, Analyse the potential solutions and Act on it
<b>NUTRITION SURVEILLANCE</b>		
For programme monitoring and evaluation	Process and/or impact evaluation	Decisions and actions taken by programme managers following the analysis of the data
For health and development planning	Assessment of trends, needs by geographic area, regions, functional, and socio-economic groups	Decisions and actions taken by planners and policy-makers following analysis of data
<b>INTEGRATING STRATEGY</b>		
For improved coverage of delivery of health services	Increased motivation and interest	Increased participation rates and regularity of attendance
	Better integration, organisation, and delivery of health services	Improved coverage and delivery at health services

Adapted from Ruel, 1995 and Garner *et al.*, 2000.

### 2.6.1 Growth monitoring as a screening tool for individual children

GM is most commonly used for screening individual children, the rationale being that it allows the early detection of growth faltering, which in turn improves the chances of success of nutrition interventions (Ruel, 1995). For screening purposes, it is more important to pay attention to the direction of the growth curve rather than the actual weight. GM has the potential to detect growth faltering at an early stage which allows for action to be taken before severe malnutrition sets in. GM as a screening tool is effective only if (i) the measurements are

accurate and mis-classifications are minimal, (ii) the coverage of the population is high, and, in particular, if the poorest and most vulnerable are covered, (iii) the screening leads to appropriate targeting and effective actions, and (iv) the cost of GM is low compared with the cost of providing the intervention indiscriminately (Chopra & Sanders, 1997).

Growth faltering occurs when the growth curve slows down, flattens or drops over two to three consecutive monthly visits (*INP Strategy*, 1999). Actions that can be taken when growth faltering occurs are, for example, counselling of the mother, nutritional supplementation, treatment of concurrent diseases such as diarrhoea, examination for diseases by a practitioner, and referral to a multi-disciplinary team for investigation and diagnosis (Garner *et al.*, 2000).

In South Africa, clinic-based GM data is used to identify malnourished children to be included in the protein-energy-malnutrition (PEM)-feeding scheme. Poor quality of GM data, as was observed in Gauteng (Marshall, 1996), has implications for identification of potential beneficiaries of feeding schemes. The role of clinic-based GM as a screening tool has been questioned because of infrequent clinic attendance, the non-representativeness of clinic attenders, and poor identification of malnourished children (Gerein & Ross, 1991).

In large community-based nutrition programmes such as the Hearth programme that operates in Haiti, Vietnam and Bangladesh (Berggren & Burkhalter, 1997), Iringa project in Tanzania (Jennings *et al.*, 1991), and Tamil Nadu Integrated Nutrition Project (TINP) in India (Chaubey, 1998), GM is used to identify malnourished children for nutrition rehabilitation. In South Africa, a non-governmental organisation (NGO) (Operation Hunger) used community-based GM to identify children and households to be included in its feeding schemes (Madrid & Breslin, 1996).

Nutrition rehabilitation programmes that use GM as a targeting tool are usually the more effective programmes. In India, TINP, which used GM to target food supplements, achieved a decline in child malnutrition of 30-50%, while comparable Child Development Scheme (CDS) areas, where GM was not used to target food, achieved 10-20% reduction in child malnutrition, at a much greater cost (Berg, 1987).

The effectiveness of providing supplementary feeding when growth faltering occurs has been questioned because: (i) the food distribution overshadows the promotion of improved practices; (ii) the food itself is usually shared among all family members; (iii) the food often replaces the home-diet; and (iv) it can create a dependence on non-local food (Griffiths *et al.*,

1996). Leakage to other family members can be reduced by on-site feeding. The approach of the Hearth model is to arrange feeding sessions for malnourished children at the homes of community volunteers (Burkhalter & Northrup, 1997). In India, malnourished children are fed on site at TINP centres (Chaubey, 1998). On-site feeding has the advantage that it creates an opportunity for the mother to be counselled while her child is being fed (Burkhalter & Northrup, 1997). The type of food provided by feeding schemes is important. The Hearth model uses local affordable foods that were identified using a positive deviance-approach, by determining which foods were given to well-nourished children by low income mothers in the same community (Burkhalter & Northrup, 1997). In the TINP, the meal supplied on site did not contain rice and was therefore seen as a snack. This reduced the possibility that the on-site feeding would replace the home-meal (Chaubey, 1998).

UNICEF has recommended that GM should not be used for screening purposes alone, but as a tool for education and growth promotion (UNICEF, 1993).

## **2.6.2 Growth monitoring for education and growth promotion**

Nutrition education is a key component of GM programmes because improvements in child nutrition often depend on changing feeding and care behaviours. Through the use of growth charts, GM has the ability to make the child's growth visible to both the health worker and the mother, and to facilitate the formulation of individualised advice to meet the specific needs of each child. The nutritional status of children can be improved by adding communication activities to child survival programmes (Fishman *et al.*, 1998).

Using GM for nutrition education is effective only if (i) the workers have adequate knowledge and skills to conduct the GM activities properly, (ii) the health workers have the time and communication skills necessary to convey the information to the mothers, (iii) the mothers understand the information given to them and can translate it into action, and (iv) the health workers and mothers together discuss feasible solutions and actions to be taken, considering the mothers' time and available resources (Ruel, 1995).

For optimal use of the growth chart for education, health workers must (i) understand the principles of the growth curve, (ii) be aware of the common causes of growth faltering in their communities, the normal local diets and availability of foodstuffs, and (iii) appreciate the common constraints mothers face in caring for their children (Chopra & Sanders, 1997). It has

been shown that, in a situation where the health workers did not comprehend the growth curve, nutrition and health education were given a low priority (Kapil *et al.*, 1996).

#### **(i) Growth charts as teaching aids**

For GM to be used as an education tool it is imperative that the mothers and health workers understand the growth chart. Although several studies reported some degree of understanding, even by illiterate mothers (Arole, 1988; Chaudhuri, 1988; Ruel *et al.*, 1990; Karim *et al.*, 1994), difficulties in comprehending the RTH chart have been reported (Gerein & Ross, 1991; Gopaldas, 1988), including South Africa (Harrison *et al.*, 1998). Teaching aids, such as an educational game using water added to a bucket suspended below recording scales, can be used to increase the mothers' understanding of the growth curve (Sohal *et al.*, 1997; Sohal *et al.*, 1998). A survey in South African clinics showed that clinic staff supported the concept, but not the composition of clinic cards (Harrison *et al.*, 1998). Several countries have redesigned the growth chart in an attempt to achieve better comprehension by the mother.

Growth trajectories or channels indicated by thin lines are often used to make the interpretation of the growth curve easier. In Indonesia and Ecuador, the mothers participated in choosing the colours for the growth chart to ensure that the colours used were culturally acceptable and well understood. The growth chart that was developed for the National Nutrition Improvement Programme (UBGP) in Indonesia consisted of a series of channels, with each channel representing 5% of the standard weight. The colours of the channels graduate from bright green to yellow, which represented the variation mothers saw between healthy rice fields and those in need of fertiliser. Each child is said to have his or her "own colour" and the mothers are encouraged to help their children grow along the child's specific channel (Griffiths *et al.*, 1996). Mothers in Ecuador associated red or deep pink, the colour in the cheeks of robust children, with health; yellow or light pink, signifying the loss of skin tone, with a sick child; and green or white with a very sick child (Griffiths, 1988). In Sri Lanka, a revised growth chart that consisted of a set of coloured and shaded curves was significantly better understood than the RTH chart (Senanayake *et al.*, 1997).

Another innovation is the development of the "bubble chart", which has a vertical layout compared to the horizontal layout of the RTH chart. Small circles, representing 100 gram intervals, are used to allow more precise plotting. Evaluation of the bubble chart showed that it was well understood by mothers (Martinez *et al.*, 1996).

In South Africa, before 1994, the former provinces, homelands and local authorities used either the RTH card developed by the former DOH, or a growth chart developed by themselves. This led to various charts (up to 15 different ones) being used in health facilities at the same time. To ensure uniformity, the DOH developed a standard RTH card that was implemented in 1994, and revised in 1999 (FIGURE 2.7) (*Integrated Nutrition Programme*, 2000). The RTH card complies with most of the guidelines listed in the next paragraph.

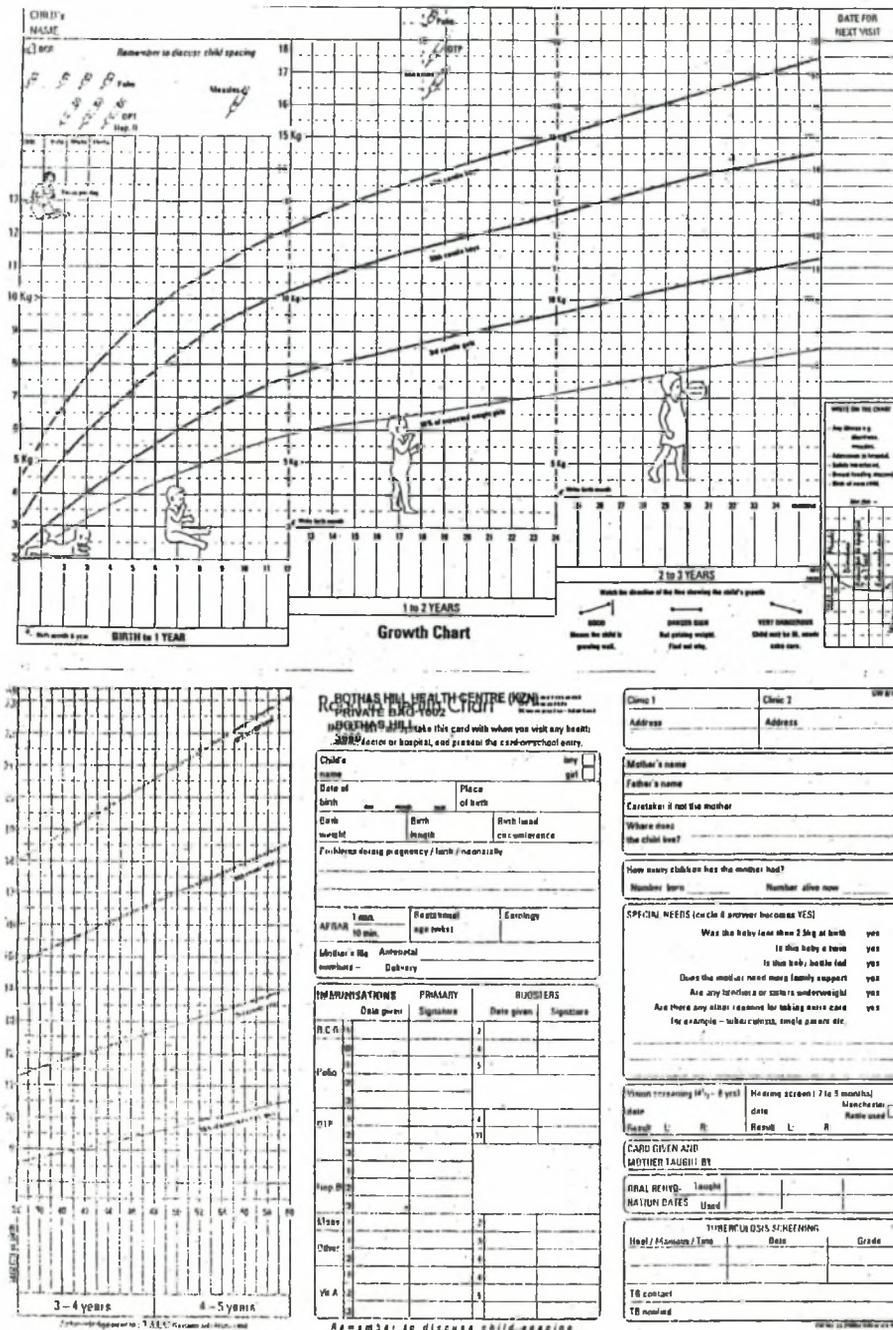
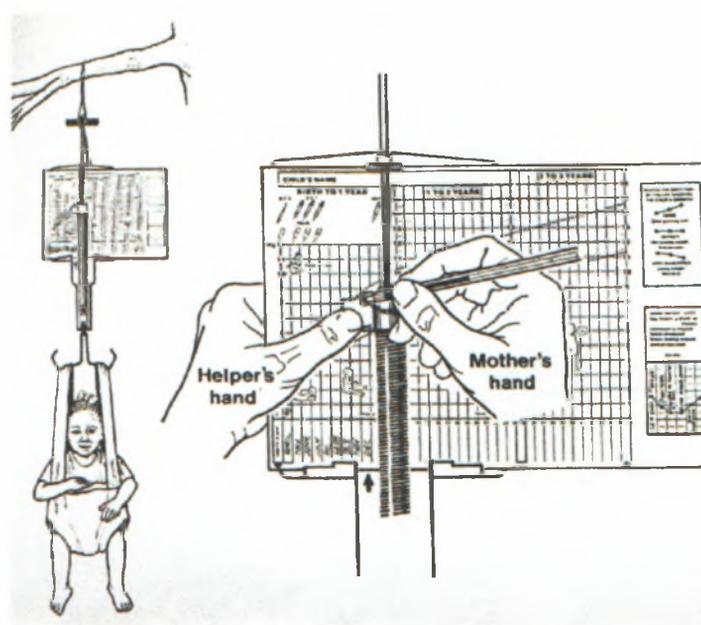


FIGURE 2.7: The standard Road-to-Health card for South Africa.

Growth charts should be of adequate size, with enough space for recording. Numbers should be clear and repeated across the curve, to guide plotting. Cards tend to be more valued when they are in the local language, are attractive to the family, and use meaningful colours. Cultural relevant details should be included. Nutritional status categories should be replaced with growth trajectories or channels indicated by thin lines or shading. There should be reminders of key behaviour for certain ages. Including key counselling points about feeding practices at specific ages on one side of the card would be helpful for the health worker. All charts should be pretested with health workers and mothers (Griffiths *et al.*, 1996; Allen & Gillespie, 2001).

### (ii) The Direct Recording Scale as teaching aid

Mothers will have a better understanding of the growth chart if they are involved in the weighing and plotting and they should, therefore, not feel intimidated or threatened by high technology scales. Most weighing scales indicate weight with a pointer on a dial, or give a digital reading. The Direct Recording Scale (DRS) introduced a simplified method of weighing through which the growth curve is directly recorded without the need to read any numbers. The DRS works with a spring that stretches one centimetre per kilogram and the child's weight is plotted on a specially designed growth chart by placing a pen through a hole in the pointer (FIGURE 2.8) (Meegan *et al.*, 1994; Meegan & Morley, 1999).



**FIGURE 2.8:** The Direct Recording Scale.  
(Meegan & Morley, 1999)

A benefit of using the DRS is that there is no need for the health worker to plot the child's weight on the growth chart. In the developing world, where schools do not have graph paper, health workers, and even primary school teachers, often find it difficult to interpret a line graph (Morley, 1997). In South Africa, clinic staff were shown to have difficulty in understanding the graph and plotting weight accurately (Harrison *et al.*, 1998).

The benefits of using the DRS were shown in Kenya. Compared to mothers whose children were weighed by health staff, Masai mothers who weighed their own children using the DRS, had a greater understanding of their children's growth patterns (Meegan *et al.*, 1994), and their children showed less growth faltering (Meegan & Morley, 1999). The cost of the DRS is low, it is made of unbreakable ultraviolet resistant plastic, it is light, easy to use, and can be kept in the community (Meegan *et al.*, 1994; Meegan & Morley, 1999).

Important criteria for choosing scales are accuracy, portability, durability, universality, minimum reading and recording errors, ability to be purchased and repaired locally, and acceptability to the community (Gerein, 1988).

### **(iii) Education and promotion**

For GM to be effective as an educational tool, the growth curve needs to be discussed with the mother and the health workers need enough time to talk to the mother. However, it is often found that the nutrition advice given to mothers is general, superficial, and didactic (Cape, 1988; Gerein & Ross, 1991), and the education lessons are presented in rote fashion (Jennings *et al.*, 1991) and are endured by the mothers in order to receive food supplements (Jennings *et al.*, 1991).

In clinics in Papua New Guinea, 71% of the consultations with the mother took less than two minutes, during which time the child was weighed, vaccinated, and treated. The children were all weighed by a nurse-aid who recorded the weights on a piece of paper. The weights were transferred to the growth charts by a nurse inside her office and the charts were returned to the mothers without any comment. In only 10% of all children seen was nutrition advice given (Cape, 1988). Clinic staff use most of their time for medical diagnosis and treatment, and they are more committed to medical than educational tasks (Reid, 1984). In contrast, in community-based nutrition programmes such as TINP (Chaubey, 1998), Hearth programmes (Elmer, 1997) and Iringa (Jeje, 1997), GM is primarily used for education and promotion at individual and community level.

Nutrition education programmes should concentrate on two or three specific nutrition-related behaviours to ensure that it provides the necessary focus and frequency to make an impact (Parlato & Gottert, 1998). According to Griffiths *et al.* (1996), although a nutrition communication strategy may include group education, individual counselling is the cornerstone of an effective and efficient programme.

A mother will accept behavioural changes more easily if she is involved in the decision-making process. This is the principle of a communication strategy called *nutrition negotiation*, which is applicable for individual children. Nutrition negotiation has three parts, namely (i) the mother and health worker discuss the standard recommendations and the feasibility for their implementation; (ii) standard recommendations, or new ones, are proposed and the mother chooses one or two practices that she is willing to try; and (iii) with their next encounter, the mother and health worker jointly assess the success of the selected actions (Griffiths *et al.*, 1996).

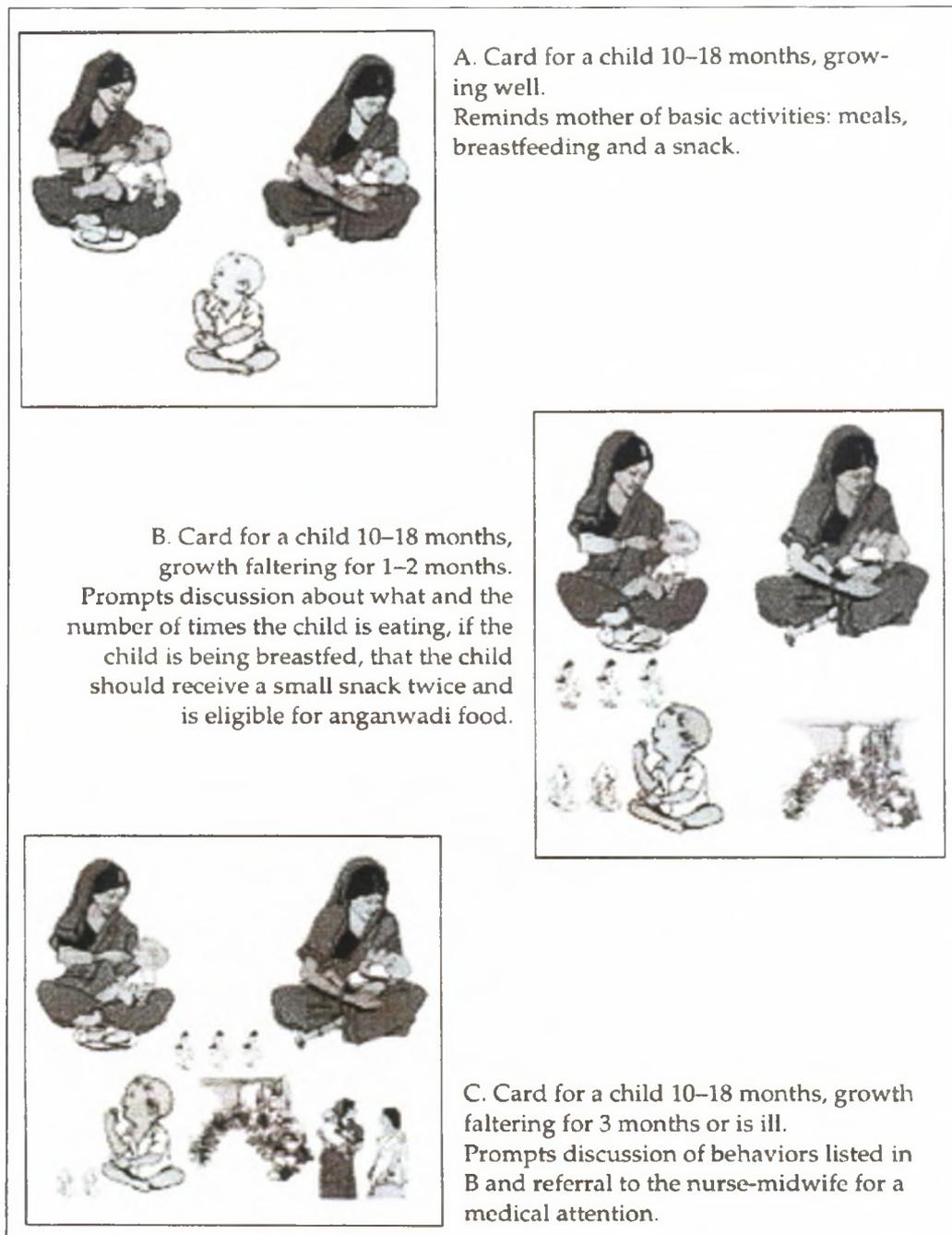
In Senegal, mothers shared experiences and came up with suggestions for others to try. Selected mothers then used these ideas in direct one-to-one counselling, helping their peers find ways to implement these practices (Griffiths *et al.*, 1996). The Hearth programme, which uses a positive deviance approach, is also based on the concept of learning from others. Mothers of malnourished children are encouraged to adopt feeding practices that were identified in families whose children were well-nourished (Burkhalter & Northrup, 1997).

Action-orientated messages are more easily accepted and better understood than messages that are based on the transfer of knowledge (Carnell, 1998). The message should aim to change a specific behaviour (Griffiths, 1988). Behavioural changes must be feasible for the target audience to implement, in terms of cost, time, and compatibility with existing practices and beliefs (Parlato & Gottert, 1998). This can be ensured by selecting a small, but representative sample of families to test, modify, retest and comment on the education message (Griffiths, 1988).

#### **(iv) Education material**

Education materials that are used to support the nutrition message should be culturally acceptable, attractive, convenient to use and interactive. In Indonesia, counselling cards that were specific, simple, concise, inexpensive and with a broad application were used in, for example, the management of diarrhoeal diseases. The counselling cards have pictures of key

practices on the one side, and counselling advice on the reverse. During the development phase of these cards the importance of pretesting was crucial in ensuring acceptability (Sutisnaputra *et al.*, 1993). Examples of counselling cards for one age group but different growth and illness patterns is shown in **FIGURE 2.9**.



**FIGURE 2.9:** Examples of counselling cards used in Indonesia. All three cards are for the same age group, but with different growth and illness patterns (Griffiths *et al.*, 1996).

Since the positive experience in Indonesia, counselling cards have been developed for several GM and child survival programmes (Griffiths *et al.*, 1996; Fishman *et al.*, 1998). Advantages of counselling cards are that the information given to the mother is specific for each individual child, and it allows negotiation and feedback (Favin & Griffiths, 1999). In West Africa, literate and illiterate volunteers used counselling cards without difficulty, and, according to them, the counselling cards increased their credibility and prestige in the village, and helped them to focus on the key messages (Parlato & Gottert, 1998). Effective use of counselling cards, however, requires extensive training (Favin & Griffiths, 1999).

For GM and nutrition education to complement one another, they should be designed together. Griffiths (1988) identified four essential components that should be considered when planning a GM programme to be used for nutrition education, namely (i) creating awareness, (ii) developing a positive climate, (iii) encouraging community participation in designing the educational plan, and (iv) affecting changes in practices.

#### **(v) Creation of awareness**

Awareness of the importance of GM should be created. In Indonesia, a slogan, "a healthy child gains weight every month", appeared in print virtually everywhere (Griffiths, 1988). In the Dominican Republic, a project symbol (a scale and a child in weighing pants with an upward triangle in the background) increased the visibility of the Applied Nutrition Education Programme, a poster asking if parents knew whether their children are healthy was used in public places, and community interest was stimulated with large growth charts on which the weights of all children in the community were plotted once every six months (Griffiths, 1988). In Tanzania, where GM was used as entry point for community-based actions to improve nutrition, health messages were broadcast over the radio, singing and dance groups were mobilised to dramatise health issues, a newsletter was produced and films were made (Chorlton, 1989).

### **2.6.3 Growth monitoring for nutrition surveillance**

Whereas the GM process promotes optimal growth of the *individual* child through a series of activities (weighing, charting, counselling, intervening), the purpose of nutrition surveillance is to monitor changes in the nutritional status of a *population* over time (Karim *et al.*, 1994).

The concept of nutrition surveillance originated in 1974 when the World Food Conference issued a resolution calling for the Food and Agricultural Organisation (FAO), WHO and UNICEF to establish a nutrition surveillance system for developing countries (Rothe & Habicht, 1993). Nutrition surveillance has been described as "scrutinising the occurrence in a population of dietary-mediated nutritional conditions, with the objective of describing the current situation, detecting trends, forecasting changes, highlighting priorities and targeting corrective and preventative measures" (Ferro-Luzi & Leclercq, 1991).

The objectives of nutrition surveillance are to improve (i) decisions about targeting nutrition-relevant services (service delivery); (ii) decisions on the use of existing resources for nutrition improvement (capacity building); and (iii) availability and access to resources for nutrition improvement (empowerment) (Johnsson, 1995). Information used for nutrition surveillance must be (i) population based, (ii) decision and action orientated, (iii) sensitive, (iv) accurate, (v) relevant, (vi) timely, (vii) readily accessible, and (viii) communicated effectively (Jerome & Ricci, 1997). The most important activity of nutrition surveillance is linking the information to the decision-making process (Rothe & Habicht, 1993).

GM data can be used in the evaluation of health and nutrition programmes, and it is an efficient way to obtain information for national nutrition surveillance, provided that the measurements are accurate, and the coverage of the population is high (Chopra & Sanders, 1997). In South Africa, stunting is more prevalent than underweight (South African Vitamin A Consultative Group, 1996; Labadarios *et al.*, 2001) and, as height-for-age is a good indicator for long-term changes in the environment and their nutritional consequences (Beaton *et al.*, 1990), it can be argued that height measurements should be included in nutrition surveillance.

It has been recommended that clinic-based GM data be used for nutrition surveillance in South Africa (Fincham *et al.*, 1996). However, clinic attenders are generally not representative of the population (Coetzee & Ferrinho, 1994). The coverage of children at clinics is low (Schoeman *et al.*, 2000), especially for the older children (Coetzee & Ferrinho, 1994). Once the immunisation schedule is completed, most mothers attend the clinic only if the child is sick (Schoeman *et al.*, 2000). The bias of clinic data towards the younger child (Coetzee & Ferrinho, 1994) complicates the interpretation of clinic data for nutrition surveillance because different factors may influence the nutritional status of the younger child as compared to the older child (Valverde *et al.*, 1981). The use of clinic-based GM data for nutrition surveillance is further hampered by the fact that children who are at risk often do not

attend the clinics, as was shown in Zaire (Gerein & Ross, 1991).

Various African countries, such as Lesotho, Swaziland, Zambia and Zimbabwe use clinic-based GM data for nutrition surveillance. Problems encountered were inaccuracies in data collection, recording and reporting; delays and irregularities in the sending of the data to the central office; and self-selection of clinic attenders (UNICEF, 1984).

Some countries are moving towards a national *community*-based surveillance system (Jerome & Ricci, 1997). Provided that the coverage is high, community-based GM data may be more appropriate than clinic-based data. The coverage of community-based programmes varies. For example, in Jamaica, the coverage was as high as 95% (Melville *et al.*, 1995), while in Bangladesh the coverage was below 50% (Karim *et al.*, 1994).

In countries plagued by famine and food shortages, such as Ethiopia (Gizaw, 1995), nutrition surveillance is used to predict food shortages, direct relief operations, target areas, screen beneficiaries, and assess the impact of relief operations. In Bangladesh, where floods, droughts and cyclones occur frequently, children's nutritional status is monitored in sentinel sites (Bloem *et al.*, 1995). In Botswana, the National Nutrition Surveillance System, which uses clinic-based GM data, was the single most important source of information for the management of a Drought Relief Programme during 1982-1988 (Jennings *et al.*, 1991).

Nutrition surveillance is useful for policy and programme development. In Bangladesh, where the nutrition surveillance system includes anthropometry, health indicators, socio-economic status and distress factors, nutrition surveillance influenced food aid and food subsidies, as well as the vitamin A capsule programme (Bloem *et al.*, 1995).

Besides being used at national level, nutrition surveillance can be used for programme management to identify target groups, monitor the process, and assess the overall programme effects (Beaton *et al.*, 1990). In Ghana, nutrition surveillance was used to identify programme modifications and additional training needs within a community-based project that aimed to reduce infant malnutrition through the production of a weaning food (Jennings *et al.*, 1991).

Johnsson (1995) identified five critical factors affecting nutrition surveillance, namely (i) perception and understanding of the nature of the nutritional problem; (ii) effective demand for relevant nutrition information and motivation to act; (iii) capability to obtain information in assessment and to use it to analyse and design actions (technical capabilities); (iv) resources to establish and maintain nutrition surveillance; and (v) resources for action to be taken. Nutrition surveillance systems may operate at community, district and national level (Johnson, 1995).

#### 2.6.4 Growth monitoring as an integrating strategy

The causes of child malnutrition are multi-faceted (FIGURE 2.1) and the solutions are often multi-sectoral. GM, therefore, lends itself well to an integrated approach. Because of its captive audience, GM has the potential to provide a forum through which other nutrition or PHC activities can be delivered. Community-based GM can be integrated with (i) programmes that have a direct impact on maternal and child health (eg immunisation); (ii) sectoral activities concerned with the health, nutrition and welfare of the family and community (eg agriculture); and (iii) professional services (Mantra, 1992).

The integration of activities should be at the point of delivery (Tandon, 1989). The integration of health services at the point of GM is typified in the posyandu system in Indonesia. Posyandu originated when community-based weighing posts were converted to integrated health service delivery posts offering mother and child health activities, family planning, immunisation, and control of diarrhoeal disease (Leimena, 1989). GM activities can also be integrated with malaria control (Mantra, 1992), productive skills training, basic sanitation, management of simple drugs (Leimena, 1989), agriculture, welfare (Chaubey, 1998), control of acute respiratory infection, and vitamin A and iron supplementation (Berggren, 1997).

As an integrating strategy, GM has the potential to improve child survival and growth by (i) reducing morbidity as a result of a more efficient delivery of health services and (ii) through increased food intake and improved dietary practices as a result of a more effective delivery of nutrition education. Improvements can be expected from increased coverage and quality of the services delivered and potentially from a synergism among the various interventions (Ruel, 1995). In both Indonesia (Leimena, 1989) and India (Tandon, 1989), integrated nutrition activities achieved better coverage than programmes operating separately. In Bangladesh, the reason for the low coverage of a community-based GM programme that provided no food or other health services was that weighing was not enough motivation for the mothers to bring their children (Karim *et al.*, 1994).

Integrating community-based GM with the health sector is not always easy (Karim *et al.*, 1994) and should be done cautiously. The GM activities can easily be overwhelmed by medical, curative activities or those of feeding or food distribution (Griffiths *et al.*, 1996). In Indonesia, the integration of community-based GM with the more "prestigious, professionally-

based delivery component", consisting of services such as immunisation and family planning, tended to marginalise the GM effort (Hendratta cited in Griffiths, 1996). In Bangladesh, community-based GM was not very successful in integrating community-based GM with government health workers (Karim *et al.*, 1994).

### 2.6.5 Growth monitoring practices

Various authors have questioned whether GM is a task worth doing (Davies & Williams, 1983; Gerein, 1988; Gerein & Ross, 1991; Chopra & Sanders, 1997). These authors focussed on clinic-based GM and questioned its credibility because of poor weighing methods, insufficient use of weight charts, poor understanding of normal patterns of weight gain, and ignorance regarding nutritional influences (Davies & Williams, 1983; Chopra & Sanders, 1997). For community-based GM programmes, incorrect use of scales, incorrect plotting of the weight and poor interpretation of the growth curve were reported (Kapil *et al.*, 1996).

For GM to provide useful information the measurements should be accurate and reproducible. Accuracy is the proximity of the measured value to the real value, while reproducibility, or precision, which bears no relation to accuracy, is a measure of repeatability (Vos, 1995). The quality of information displayed on the RTH card is often inadequate for GM because of inaccurate weight measurements or inaccurate plotting of the weight (Kuhn & Zwarenstein, 1990). For reliable measurements, accurate scales (Davies & Williams, 1983), and proper installation and good maintenance of instruments (Vos, 1995) are essential.

Concerns regarding the practice of weighing children in cold rooms and dressed in varying amounts of clothing have been raised (Davies & Williams, 1983). Workers are often reluctant to undress the children if the weather is cold. It is doubtful whether this would make a significant difference to the recorded weight, as a child's typical sweater, hat and plastic shoes weighs only 150 grams (Gerein & Ross, 1991).

Height measurements are difficult and time-consuming (Chopra & Sanders, 1997). More than 90% of the variability of height measurement is ascribed to the child (eg posture) (Vos *et al.*, 1990). Because of poor inter-observer reliability (Coetzee & Ferrinho, 1994) and diurnal variation (Buckler, 1978), it is preferable that individual children are monitored by the same observer (Vos & Bailey, 1994), using the same instrument (Vos, 1995), at a specific time of day (Buckler, 1978).

### 2.6.6 Training of health workers

Implementation of successful and sustainable community nutrition programmes require awareness, knowledge and skills (Ndure *et al.*, 1999). The need for ongoing training of health workers at all levels has been emphasised (Chopra & Sanders, 1997). Educating or training people can have various approaches, three of which are listed below.

*Authoritarian approach:* The function is to conform; it has an oppressive effect on people and communities as it allows little or no participation; the trainees fear the trainer.

*Paternalistic approach:* The function is to reform; has a deceptive effect on people and communities as it pretends to be supportive, but resists real change; the trainees feel gratitude towards the trainer.

*Humanitarian and democratic approach:* The function is to transform; has a supportive effect on people and communities as it helps people find ways to gain more control over their own lives; the trainees trust the trainer.  
(Werner & Bower, 1995).

For training health workers, the humanitarian approach is recommended (Werner & Bower, 1995). Initial training and continuous in-service training are important.

#### (i) Initial training

Across programmes, there is a wide variation in initial training, varying from 6 months in the Iringa project (Jennings *et al.*, 1991), to only one week in UPGK, Indonesia (Mantra *et al.*, 1993). According to Griffiths *et al.* (1996), the duration of the initial training should be about 10 days (not necessary consecutive days), assuming that in-service training will be provided. The initial training should be interspersed with work in the community, enabling the workers to relate what they are facing in the community with their training. The objectives of the initial training specifically for GM are listed in **TABLE 2.5**.

**TABLE 2.5:** The objectives of the initial training programme for workers in growth monitoring programmes.

<b>Responsibility</b>	<b>Skill objective</b>
1. Establishing the GM activity in the community	1.1 Knows the value of growth monitoring and can explain it meaningful to community members 1.2 Interests and involves community leaders in the activity
2. Weighing and measuring children	2.1 Can structure monitoring procedure to minimise confusion 2.2 Can set up and use tools correctly 2.3 Can accurately weigh or measure children
3. Completing the growth chart	3.1 Can interview the mother 3.2 Can calculate child's age or birth date if required 3.3 Can plot the weight correctly on the growth chart
4. Offering advice, or education, or referral to rehabilitation programmes or medical care	4.1 Can correctly interpret chart 4.2 Can communicate effectively with and involve mothers to define cause of growth faltering 4.3 Can use negotiation to offer appropriate advice on diet or home care for child not growing adequately or who is ill 4.4 Can refer child in need of additional assistance
5. Stimulating the community to work together and help malnourished children	5.1 Can discuss the community profile given by monitoring results and recommend community actions to alleviate the situation
6. Keeping information that will help evaluate the programme or the progress of the community	6.1 Can compile a community record for each session or keep a simple tabulation

(Griffiths *et al.*, 1996)

Training community workers for GM needs to be experiential (community-based, hands-on, job-related), consisting of sessions in which trainees: (i) become familiar with the instruments or materials; (ii) observe and discuss materials and instruments being used optimally and with common flaws; (iii) role-play with other trainees; and (iv) try "at home" and then share the experience with the trainer. This needs to be done for the (i) GM aspect (weighing, plotting, interpreting); (ii) promotion aspect (determining causes for growth faltering, counselling, follow-up); (iii) work with the community to stimulate action; and (iv) management and organisation of the GM activities in the community (Griffiths *et al.*, 1996). Practising skills necessary to accomplish the task should be integral to the training course (WHO, 1997).

**(ii) In-service training**

Initial training should be followed-up by continual in-service training and supportive supervision. This will ensure that new concepts and practices covered in the training are incorporated into the daily activities. In-service training should be competency-based, focussing on operational, rather than the theoretical aspects. Supportive supervision implies that, during visits, the supervisor will assist the worker to solve problems at community level (Griffiths *et al.*, 1996; Parlato & Gottert, 1998).

On-the-job peer-to-peer training has the potential to be more successful than "official" training courses. It is practical and addresses day-to-day problems. Health workers can admit what they do not know to a peer forthrightly in a way they would never do in a formal classroom setting (Robinson *et al.*, 1998).

The carefully structured training course of the Integrated Care of the Child Programme in Honduras is a good example of thorough training, which is hands-on and experiential. The initial training consisted of a five-day training course, which was followed-up by monthly six-hour in-service training sessions during the first year. In-service training focussed on the volunteers' perceived problems and observations of the supervisor. This motivated the volunteers and improved their skills (De Alvarado & Griffiths, 1998).

In selected Integrated Child Development Scheme (ICDS) projects in Rajasthan, the poor performance of experienced health workers stressed the importance of follow-up training and reinforcement (Kapil *et al.*, 1996). In ICDS projects in Baroda, health workers failed to attend to growth faltering. Their unusually high levels of education suggested that their poor performance was because of insufficient training and not because of inability on their part (Gopaldas, 1988). Health workers often experience difficulties in using the growth chart to identify malnourished children (Gopaldas, 1988; Kapil *et al.*, 1996). Brabin *et al.* (1984) emphasised the importance of training when they showed that the use of simplified methods to identify malnourished children did not improve the performance of the health workers.

Successful programmes usually invest in the training of community health workers (CHWs). In some countries, such as Indonesia, the training of volunteers is a priority at national level (Mantra *et al.*, 1993). In Tanzania, multi-purpose training centres were built and training courses for technical and non-technical staff are conducted annually (Jennings *et al.*, 1991).

The development of well-designed training manuals is recommended (Parlato &

Gottert, 1998). In Tanzania, more than 11 handbooks were developed and were used for training and supervision (Jennings *et al.*, 1991). It has been suggested that such manuals can be used by other programmes, provided that they are adapted for local conditions, tested, and translated into the local language (Parlato & Gottert, 1998).

Jennings *et al.* (1991) reviewed 17 community nutrition programmes and concluded that, with good training and support, strong referral systems and well-trained supervision, local community members can successfully perform GM tasks and nutrition education.

### **2.6.7 Clinic-based versus community-based growth monitoring**

The strengths and limitations with respect to design, implementation and evaluation of clinic- and community-based GM programmes differ greatly, and, a clear distinction should be made between these two types of programmes. In community-based nutrition programmes such as TINP (Chaubey, 1998), Hearth programmes (Elmer, 1997) and Iringa (Jeje, 1997), GM is primarily used for education and promotion at individual and community level. In contrast, clinic staff use most of their time for medical diagnosis and treatment, and they are more committed to medical than educational tasks (Reid, 1984).

The use of clinic-based GM data is disappointing, because of inaccuracies in data collection, recording and reporting, and the selectiveness and erratic attendance of the clinic participants (UNICEF, 1984). Locally, the nutritional status of clinic attenders is not representative of that of the population (Coetzee & Ferrinho, 1994; Solarsh *et al.*, 1994), making it dangerous to generalise the population from clinic data (Chopra & Sanders, 1997).

Clinic data favours the younger child. For example, at the Alexandra clinic children aged 2 years and older are seldom weighed and 68% of the child contacts are younger than 12 months (Coetzee & Ferrinho, 1994). This is not unique to South Africa. At the under-5 clinic at the University of Kinshasa Hospital, only 3.3% of children stay in the programme after the age of 24 months. The most important reason for dropping out, cited by the mothers, was the end of the immunisation scheme which coincides with measles vaccination at 9 months (Mapatano *et al.*, 1997). In several provinces in Papua New Guinea less than 50% of the children younger than 5 years attend the clinics (Cape, 1988).

In certain countries, such as Kenya (Ruel, 1995), the activities of national facility-based GM programmes were extended into villages in an attempt to increase the coverage of

GM. In India, the transfer of GM to the community resulted in a significant increase in attendance (Chaudhuri, 1988). The most extensive community-based GM programme is probably the posyandu system in Indonesia which operates in an estimated 90 000 to 100 000 of Indonesia's 400 000 villages (Mantra *et al.*, 1993). In 1989, the posyandu were accessible to approximately 80% of all children under 5 (Jennings *et al.*, 1991). In 1992, there was approximately 250 000 posyandu, and about 1.25 million volunteers (Ministry of Health, 1993). Although the coverage of the posyandu system is high, continued participation over long periods of time varies from 34% to 69% (Jennings *et al.*, 1991). Benefits of community-based GM are reduced travelling and time needed to attend the GM session, which enables more frequent participation (Chaudhuri, 1988).

In community-based nutrition programmes, GM is nearly always integrated with other activities, and the focus of the GM component in these programmes is on education and promotion, while, in addition, some programmes use GM to target recipients for their rehabilitation programmes (see TABLE 2.6).

#### **2.6.8 Growth monitoring in community-based programmes**

There is a shift towards community-based GM programmes. Jennings *et al.* (1991) reviewed 17 nutrition programmes and anthropometric data was collected in all but one of them. The role of anthropometric data varied from identifying target groups, monitoring the nutritional component of the programme, and measuring overall programme performance and impact.

Very little data has been documented on GM programmes in rural areas in South Africa. In the Hlabisa health district in KwaZulu-Natal, CHWs weigh children under 3 years of age at their homes using a DRS. They use the GM data to counsel the family members, using charts illustrating the possible causes of growth faltering at different ages. Every three months, the GM data is presented at a community meeting. This resulted in the initiation of various nutrition interventions (Chopra *et al.*, 1996; Chopra & Sanders, 1997).

GM is often used in large PHC and nutrition programmes to build confidence and spur critical improvements in practices by families; motivate community action; integrate and target health and nutrition services; and raise awareness of health and nutritional problems for policy and advocacy (Griffiths *et al.*, 1996). The role of GM in various community-based nutrition programmes is illustrated in the examples listed in TABLE 2.6.

**TABLE 2.6:** Examples of community-based programmes that include growth monitoring. The operation of the programme, the role of growth monitoring within the programme, integrated activities and actions resulting from the GM, and lessons learned are given for each programme.

Programme	Operation	Role of GM	Integrated activities / Actions	Lessons learned	References
<b>Heart Model Haiti, Vietnam and Bangladesh</b>	Community volunteers feed malnourished children one nutritious meal each day for two weeks, using local, affordable foods identified through mothers of well-nourished children (positive-deviance). Mothers are motivated and educated.	Create an awareness on malnutrition within the community Identify malnourished children	Deworming Referral to health facility for underlying illness Vitamin A and iron supplementation Nutrition rehabilitation	A positive-deviance approach can be used to teach mothers to rehabilitate their own children. Project evaluation should include impact indicators as well as process indicators.	Berggren & Burkhalter, 1997; Elmer, 1997 Burkhalter & Northrup, 1997 Levinson <i>et al.</i> , 1999
<b>Integrated care of the child Honduras</b>	Small groups of volunteers weigh the children every month. Operates at two levels: (i) educating families of young children to improve household practices; and (ii) working with the community to improve community conditions that favour the health of children.	Every four months, the data on the growth of the children and related information are reviewed during a community meeting during which a collective action plan is developed to improve the well-being of the children.	Immunisation Care of the sick child Promotion of optimal child-feeding practices	Key programme personnel should have a clear vision of community work. Attention should be paid to programme management. Key tools and forms should be developed and tested during the programme development phase.	De Alvarado & Griffiths, 1998
<b>Comprehensive Rural Health Care Project at Jamkhed India</b>	Evolved from clinic-based GM. Monthly GM activities performed by village volunteers	Monitoring rural development programmes.	Feeding programmes during pre-harvest season Obtained measles vaccines* Improved sanitation*	Monthly GM by volunteers was critical to the success. GM was viewed as monitoring the growth of the entire community, and of the adequacy of their attention to the future generation. Communities can and will actively participate only if they identify their own needs in the priority they see fit.	Arole, 1988

*Continued on next page*

**TABLE 2.6 (continued):** Examples of community-based programmes that include growth monitoring. The operation of the programme, the role of growth monitoring within the programme, integrated activities and actions resulting from the GM, and lessons learned are given for each programme.

Programme	Operation	Role of GM	Integrated activities / Actions	Lessons learned	References
<b>Child in Need Institute Programme India</b>	Evolved from clinic-based GM Monthly GM by mothers, advising each other at mobile clinics established in the outlying villages	GM activities are linked to education and communication.	ORT demonstration Health and nutrition education Demonstration of supplementary feeding Immunisation Health check-up Ante-natal care	GM was critical for the evolution of the community-based nutrition programme Transfer of GM to community enabled frequent participation and empowered the community to take a deciding role in nutrition and health promotion activities.	Chaudhuri, 1988
<b>Integrated Child Development Services (ICDS) India</b>	Integrated approach delivering PHC as well as nutrition and education services at village level. Run by local workers.	Monthly weighing	Supplementary feeding Immunisation Management of diarrhoeal and respiratory infections Family planning	Integrated nutrition interventions achieve better coverage and improvement in nutrition status than vertical programmes.	Tandon, 1989.
<b>Posyandu system Indonesia</b>	Monthly GM sessions held at a local venue and run by volunteers. It is organised by the community and run by volunteers with the provision of technical assistance from the local health centre staff.	Monthly weighing and counselling	Immunisation Family planning Control of diarrhoeal diseases Malaria control Productive skills training Basic sanitation Simple drugs	Participatory techniques are useful Training materials should be tailored and participatory Selection of volunteers is important Supervision, monitoring and reinforcement of volunteers are crucial	Leimena, 1989 Mantra, 1992 Mantra et al., 1993 Sutisnaputra <i>et al.</i> , 1993
<b>Iringa Tanzania</b>	Developed within the UNICEF conceptual framework for child malnutrition. Uses the triple A cyclic approach. Community collected GM data and analysed it.	Measure the progress of individual children Measure the progress of the programme Analyse why some children are malnourished and others not	Increased feeding frequency Encourage better use of health services Treatment of diarrhoea Reduce micronutrient deficiencies Home gardening Small animal husbandry Improved sanitation	Continued government support is essential Two factors underpinned the success namely, universal education & a high level of political mobilisation in villages that provided a organised form of communication	UNICEF, 1998 Jeje, 1997

### 2.6.9 Ratio of workers to children

UNICEF recommended that GM sessions be limited in size so that counselling can be conducted properly (UNICEF, 1990). The ratio of workers to children is an indicator of intensity, with other words, how much resources is needed per participant (Allen & Gillespie, 2001). In community-based nutrition programmes, GM is seldom performed on its own and the ratio of workers to children will depend on the activities of the programme.

A heavy work load of health workers can cause nutrition programmes to perform poorly, as was the case in ICDS in India where the ratio was one worker for 200 families (Allen & Gillespie, 2001). Workers often become overloaded because they are expected to care for too many children. The workload can be reduced by limiting the number of tasks and by seeking the support of the community. The latter will help towards community participation, ensuring ownership, sustainability and cost-effectiveness (Griffiths *et al.*, 1996).

Although the ratio of workers to children should be kept relatively low, there are several factors that should be taken into consideration (Griffiths *et al.*, 1996). Whereas a full-time CHW may be able to cover 50-100 children (Heaver cited in Griffiths *et al.*, 1996), particularly if only 20-25 of those children need follow-up, a volunteer who is working only for a limited amount of time should cover not more than  $\pm 20$  children (Griffiths *et al.*, 1996).

### 2.6.10 Measuring the benefits of growth monitoring

For GM programmes to be evaluated, the purpose and expected outcomes need to be formulated (Garner *et al.*, 2000). Indicators must be relevant, measurable, economical, and have a time dimension (Ndure *et al.*, 1999). Indicators need to be specified, taking into account validity (the ability of an indicator to measure what it is supposed to measure), reliability (whether similar results are obtained by different people in similar circumstances), specificity (the indicator's immunity to changes in what it is not supposed to measure), and sensitivity (the indicator's ability to detect changes in what it is supposed to measure) (Panerai, 1998). Potential indicators include nutritional status, morbidity and mortality; number of appropriate referrals for medical care, specialist assessment, or social interventions; maternal knowledge; and satisfaction with the service (Garner *et al.*, 2000).

Chopra and Sanders (1997) mentioned, quite rightly, that there is very little literature

that evaluates the effectiveness of GM in a well-designed and controlled manner. Evaluation of GM programmes is difficult because of the lack of appropriate and comparable control groups. Garner *et al.* (2000) searched the Cochrane controlled registers, MEDLINE, EMBASE, CINAHL for randomised or quasi-randomised comparisons of GM programmes. Only two studies, one in India and one in Lesotho, met their selection criteria. The study in India did not show a significant impact on nutritional status (George *et al.*, 1993), while the Lesotho study showed that education can improve the mothers' interpretation of the growth chart (Ruel *et al.*, 1990). There are indications that GM *per se* has the potential to improve nutritional status. A large ecological survey including 40 municipalities in the State of Ceara, Brazil, showed that the percentage participation in GM was inversely associated with the prevalence of inadequate weight gain in children, after controlling for other factors (De Souza *et al.*, 1999).

Unless a programme has been designed and implemented to use growth data for decision making and action, there is no reason to expect that the monitoring and promotion of growth will make a difference to health and nutrition outcomes (Griffiths *et al.*, 1996).

In developing countries, GM has become an important component of many child health programmes. The role of GM in these programmes varies from being used to target malnourished children for nutrition rehabilitation (Berggren & Burkhalter, 1997), promote health through education (Griffiths, 1988), increase community participation in PHC (Leimena, 1989), mobilise communities (Jeje, 1997), and reassure parents about their child's health (Garner *et al.*, 2000). Evaluating community-based GM in terms of impact on nutritional status is difficult because the programmes are usually multi-component integrated child programmes, with GM being one of many activities

Where GM was integrated with either feeding programmes (Sternin *et al.*, 1997), food supplements (Melville *et al.*, 1995), or community development activities (Arole, 1988), a significant improvement in child malnutrition was observed. In these programmes, the improvement in nutritional status was attributed to the total programme and not to a specific aspect of the programme (Melville *et al.*, 1995). For example, in Jamkhed, special feeding programmes during the pre-harvest season, obtaining measles vaccine, and improved sanitation (Arole, 1988) probably all contributed towards the improved nutritional status.

Community-based GM can create an awareness of nutritional problems and empower communities to initiate actions and demand certain services. In Iringa, an improved understanding of factors involved in the nutritional well-being of children helped the villagers

to plan and initiate actions that contributed towards better growth and overall child health (UNICEF, 1998). In India, GM activities resulted in the establishment of feeding programmes during the pre-harvest season, enabled the community to demand and obtain the measles vaccine, prompted improved sanitation (Arole, 1988) and improved water supply, and led to child care, home gardening and poultry farming activities (Chaudhuri, 1988).

Attending GM programmes can result in improved health practices. In Indonesia, mothers who attended the posyandu were more likely to know how to prepare the oral rehydration therapy (ORT), and they were also more likely to give the child ORT during an episode of diarrhoea, as compared to mothers who did not attend the posyandu. Immunisation coverage of children who attended the posyandu was higher than those who did not attend the posyandu (Kaye & Novell, 1994).

GM data can affect policy decisions and national programme modifications. In Bangladesh, nutrition surveillance influenced food aid and food subsidies, as well as the vitamin A capsule programme (Bloem *et al.*, 1995). In both Jamkhed (Arole, 1998) and Iringa (Jeje, 1997), GM data was used to monitor the progress of rural development programmes, allowing for modifications to be made.

Whereas scientists and health workers view the success of GM and child health programmes on measurable and clearly defined health and nutritional indicators, communities often view monthly GM as a reflection of their pride in their future generation (Arole, 1988). In India, mothers appreciated the GM process and viewed the monthly GM as an important opportunity to be assured about the health of their children (Chaudhuri, 1988). A benefit of GM is the opportunity for mothers to discuss queries about child care when bringing their babies to be weighed (Davies & Williams, 1983).

A potentially harmful effect of GM is that parents could become anxious about their child's weight, and may feel guilty if the child loses weight (Garner *et al.*, 2000). In India, superstitions and taboos regarding the weighing of children are prevalent (Arole, 1988). In Bangladesh, many mothers do not like to have their babies weighed or measured, because they believe that it may frighten the child and make them cry, which, in turn, will make them ill (Filoramo, 1997).

Although it is difficult to measure the impact of GM *per se*, the value of community-based GM lies in its ability to (i) build confidence and instigate improvements in household practices, (ii) motivate community action, (iii) integrate and target health and nutrition

services, and (iv) raise awareness of health and nutrition problems for policy advocacy (Griffiths *et al.*, 1996).

### 2.6.11 Key elements of successful growth monitoring programmes

Although the specific activities of community-based nutrition programmes vary, they all have the same objective, namely, to implement sustainable approaches to combat malnutrition. The most common stumbling blocks in achieving this goal are inappropriate planning; ineffective management; poor targeting of programme beneficiaries, lack of commitment from political entities; and failure to get adequate resources for nutritional activities (Ndure *et al.*, 1999).

According to Allen & Gillespie (2001) success factors for nutrition programmes are

- (i) the creation of an awareness of the prevalence, consequences and causes of malnutrition, including the hierarchy of immediate, underlying and basic causes, and the need to address all three levels;
- (ii) the initiation, promotion and support of a process whereby individuals and communities participate in assessing the nutritional problem and decide on how to use their own and additional outside resources for actions;
- (iii) the clear identification and definition of time-bound targets at all levels of the programme;
- (iv) the identification and support of facilitators and community mobilisers, and appropriate balance between top-down and bottom-up actions and effective community-based monitoring; and
- (v) the involvement of local NGOs, who often provide excellent facilitators as well as cultural relevant training; NGOs are usually accountable to the community, which facilitates sustainability.

Programme management is as important as the technical features. Factors such as work load, logistics of weighing sessions, and relationships between the volunteers and the head of the community, among many other issues, are important to ensure the success of the programme (De Alvarado & Griffiths, 1998). The requirements for successful GM and constraints for achieving it are summarised in **TABLE 2.7**, while **TABLE 2.8** provides a guide for the evaluation of growth monitoring programmes from the World Bank's Nutrition Toolkit (Griffiths *et al.*, 1996). The scale ranges from negligible to excellent use of a concept. A project with a higher score will be more effective, all other things equal.

**TABLE 2.7:** Requirements for and factors contributing towards successful growth monitoring programmes.

<b>Requirement</b>	<b>What is needed for</b>	<b>Contributing factors</b>
Accurate measurements	Appropriate skills Appropriate training Accurate equipment, proper installation and good maintenance	
Accurate plotting of the weight	Appropriate skills Appropriate training Easy to use growth charts	Use of the DRS
Correct interpretation of the growth curve, focussing on adequate growth	Easy-to-use growth charts	Caregiver is involved Caregiver participated in developing the growth chart Teaching aids
Minimal mis-classifications	Accurate weighing and plotting Correct interpretation	
Targeted, appropriate counselling ▶ analyse causes of inadequate growth ▶ awareness of common causes of growth faltering, local diets and availability of foods in community ▶ appreciate constraints mothers face in caring for children	Counselling material Clear and feasible options for action Follow-up	Additional information eg illness is recorded Mother is involved in the decision making process
Effective nutrition education ▶ create awareness ▶ develop a positive climate ▶ affecting changes in practices	Communication skills Education material that is specific, concise, inexpensive, culturally acceptable, attractive, convenient to use, and interactive	Involvement of mothers during the development phase Concentrate on 2-3 specific nutrition related behaviours
The mothers understand the information given to them and can translate it into action	Action orientated messages Aim to change a specific behaviour Behaviours must be feasible to implement in terms of cost and time, compatible with existing practices and beliefs	Messages must be pre-tested and modified before used
High coverage, and, in particular, the poorest and most vulnerable are covered	Awareness	Community- or neighbourhood-based.
Good management	Structured guidelines	Community involvement
Community-based workers	Limited, well-define tasks	Selection endorsed by community
Training and supportive supervision	Hands-on, emphasis on problem solving	Structured training programme Training manuals

Cape, 1988; Griffiths, 1988; Gerein & Ross, 1991; Meegan *et al.*, 1994; Ruel, 1995; Chopra & Sanders, 1997; Sohal *et al.*, 1997; Allen & Gillespie, 1998; Carnell, 1998; Parlato & Gottert, 1998

**TABLE 2.8:** Guide for assessing the quality of implementation of growth monitoring programmes (Griffiths *et al.*, 1996).

Implementation Quality Issue	1. Negligible	2. Minimal	3. Fair / Moderate	4. Good	5. Excellent
<b>Participation of mothers and families</b>	Mothers only attend if they receive some incentive; attend sporadically; not asked to be involved; chart not made for or kept by family.	Most mothers attend < 6 times per year and are passive participants; keep child's growth chart but have little understanding of it.	Mothers attend > 6 times per year; participate in weighing and want to know weight; express motivation to change practices so child will gain weight; ask questions; keep chart.	80% of mothers attend regularly; interpret growth pattern; plan to try specific behaviour; use weight gain to indicate success; growth chart tailored for family.	Mothers help to weigh child and interpret growth pattern; with worker, choose actions to improve growth; share experiences with other mothers; all materials are developed for mothers.
<b>Guidelines for decision-making based on child's progress</b>	No guidelines for decisions.	Guidelines use only nutritional status; status used for supplementary feeding decisions at service delivery point.	Guidelines combine nutritional status with health or weight gain criteria; interpretation not clear; action plan suggestive, not specific.	Guidelines for decisions by gaining, not gaining, or losing weight, but are developed for only one aspect of the programme (eg. food) or for one level (eg. community)	Criteria for adequate and inadequate growth combined with health status; used at all programme levels, with clear guidelines for decisions and actions.
<b>Targeting and integration of programme components</b>	Children weighed but weights not used for targeting or integration.	Weighing linked only to decisions such as feeding; or frequency of weighing based on nutritional status.	Targeted referral within health system, based on nutritional status / or growth.	Use growth for referral to other services in community and some targeting of programme actions, such as health care, but no follow-up.	Close coordination with programme and community services; good targeting and follow-up.
<b>Community awareness and decision making</b>	No community-level use of data (health system only).	Health system provides some feedback to part of community.	Community worker compiles nutritional status data periodically and shares results with community, but information does not trigger actions.	Community organisation receives and discusses aggregate growth and nutritional status information regularly; and analyses causes of problems.	Community compiles, discusses and frequently bases decisions / actions on data; takes pride in having few under-nourished children and in children who grow adequately.
<b>Individual nutrition counselling</b>	Either no counselling or messages concern only attendance at weighing.	Group nutrition education talks for mothers; topics are generic.	Individual nutrition education for those targeted, but messages are general, not tailored.	Counselling tailored to the individual child who is not growing; counselling more intensive, as needed.	Adequacy of growth determines content and intensity of counselling; nutrition negotiation used; targeted materials used.
<b>Worker and workload</b>	In a fixed facility; growth promotion is one of many responsibilities; no incentive to give attention to growth promotion tasks.	In fixed health facility with occasional outreach has auxiliary assigned responsibility; no incentive to give attention to growth promotion except to food distribution.	In community, extension of health centre, multipurpose; overworked; few incentives.	Community worker responsible for nutrition, may work with multipurpose worker; not overworked; some performance-based incentives.	Community worker has help and will make home visits; percent of children gaining weight is part of job performance.
<b>Training of workers</b>	Emphasis on weighing and charting; one-time occurrence; didactic; theoretical.	Emphasis on weighing and charting, plus nutrition education and rehabilitation are discussed, but low priority and are nonspecific; still theoretical, but divided into shorter sessions.	Emphasis on weighing and charting, plus analysis of causes and how to target feeding; general nutrition advice, recipes, etc; task-oriented; cases presented; short sessions.	Emphasis on weighing and charting, plus analysis of causes and how to target feeding; general nutrition advice, recipes, plus community dynamics, counselling, using materials and giving targeted advice; task-oriented; cases and practices; short sessions with follow-up of training in community.	Previous accomplishments plus teaching how to negotiate with mothers; emphasis on community motivation and counselling; previous characteristics plus methods devoted to practice, self-assessment and community follow-up.
<b>Supervision of nutrition worker and activities</b>	Check only monthly reporting forms, at best growth charts; visits are at best sporadic.	Check records and frequency of education or receipt of food; visits infrequent; if a problem occurs, blame placed on worker.	Previous accomplishments plus observes growth monitoring sessions and asks about child nutrition; visits are at least twice a year and attention given to improved performance.	Observe sessions, assess targeting and decisions on actions based on growth data; quarterly visits; work with community; emphasis on improved performance.	Previous accomplishments plus visits to mothers with worker to help solve problems; initial visits monthly; continued training.
<b>Detailed operational plan</b>	Only a few general norms available.	Norms developed with general guidance but not for all aspects of the programme.	Guidelines developed for implementation of all aspects of programme; some response to local needs in purchase of weighing scales, etc.	Full set of operational guidelines and tools available to respond to local needs.	Full set of operation guidelines with options and examples of local initiatives; materials respond to local needs; budget for local innovations.
<b>Programme level monitoring</b>	Data not compiled, although can be sent through system.	Data compiled, but not used to affect programme.	Compiled only for nutritional status; decisions taken on supplies of commodities only.	Data on growth and nutritional status compiled, presented, and discussed, but not at all levels.	Data on growth used for programme decisions (design, expansion) and advocacy at all levels.
<b>Commitment to sustain programme</b>	Undernutrition part of dialogue at national level only, among programme personnel.	Commitment to reducing undernutrition seen only in general terms, not in local action.	Commitment at all levels to reducing malnutrition.	Adequate growth is used at household and community levels but does not have commitment outside of programme personnel at other levels to sustain resource allocation.	Adequate growth is a national development objective; commitment to achieving this is seen at all levels; local resource allocation.

## 2.7 COMMUNITY PARTICIPATION

Community participation is an essential component of the proposed core package of PHC services in South Africa (Rothberg & Pettifor, 1998) and it enables communities to take responsibility for their own health (Mantra, 1992). It does not refer to passive compliance where communities are viewed as data sources or passive recipients of an intervention (Courtney *et al.*, 1996). It is a dynamic process in which people are involved in planning, implementing, monitoring and evaluating activities that affect their lives (Mantra, 1992).

Community participation includes various activities, such as, participation in decision making processes; creation or strengthening of community groups and the delegation of authority to these groups to advise, supervise, and/or manage the programme; training of local people as project staff; creation of linkages within the project to other community groups; and good communication and information sharing at all levels (Jennings *et al.*, 1991).

A model for empowerment through community participation that was used to guide research on community-based intervention in a South African township was based on the following: (i) people have a body of beliefs and experiences on which they base their actions; (ii) people act within the context of their socio-cultural environment; (iii) the socio-cultural environment is made up of facilitating and restraining forces that define how people live; and (iv) the options open to individuals for meeting self-care needs are those that fall within the range of where individual beliefs and experiences overlap or are compatible with the socio-cultural environment. The model is based on the assumptions that health care takes place within the context of a social system that has facilitating and restraining forces and that people are active agents within the system (Hildebrandt, 1996).

According to Rifkin (1996), community participation should not be viewed within a single framework. In health care programmes, community participation is often viewed within either target-orientated<sup>3</sup> or empowerment<sup>4</sup> frameworks. In analysing community participation in health programmes, both frameworks are consistent within themselves. However, they are

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<sup>3</sup> Views community participation as a way of mobilising community resources to supplement health services; a means to an end; passive responding to professional direction; a product of PHC and evaluated by quantitative methods.

<sup>4</sup> Views community participation as a way of giving people power over their choices; a means in itself; active and based on community initiatives; a process whereby communities are strengthened in their capacity to control their own lives and make decisions outside the direction of professionals and authorities and evaluated by qualitative methods.

too restricting to create realistic expectations about programme outcomes, mainly because they are seen as an intervention and are analysed as linear, causal and contributing to a system which is viewed as a sum of all its parts. Community participation should rather be seen as an adaptive change analysis which does not view community participation as an intervention but rather as an influence on an entire system. These influences are not linear nor always causal but an adaptive learning process of a system in which the sum is greater than its parts. Community participation should therefore be viewed as an iterative learning process allowing for a more eclectic approach to be taken (Rifkin, 1996). Community participation is not an end in itself, and patience and tolerance are required to build trust (Jinabhai *et al.*, 1997).

Community entry is an important step in the process of community participation. This is a gradual social process of bringing people together to prepare them to work together (Tareen & Abu Omar, 1997). Health professionals should familiarise themselves with cultural beliefs before entering a community (Davis & Reid, 1999).

Community participation has two dimensions. Firstly, the community acts together, and, secondly, the community interacts with the public health sector or provider (Tareen & Abu Omar, 1997). The level of community participation depends on how important the problem is viewed by the community, the type of actions that are required, and the health professional's knowledge and attitudes towards community participation (Mantra, 1992).

Partnerships between health professionals and communities must be established (Courtney *et al.*, 1996) to ensure that the concerns and needs of both parties are considered (Jennings *et al.*, 1991). Respecting cultural and other differences is an integral part of the relationship between the community and the health professional (Courtney *et al.*, 1996). For sustainable community participation, the communities must be fully involved and committed, and, on the other hand, the health professionals must be willing and equally involved and committed to support the efforts of the community (Mantra, 1992). Both parties must recognise and value the importance of each other's role and contribution as active participants (Courtney *et al.*, 1996). Professionals must be transparent about their objectives, inherent benefits and limitations, as unreasonably high expectations or promises are serious constraints on community participation (Jinabhai *et al.*, 1997). The role of the health professionals is to facilitate empowerment within communities, enabling the community to take effective actions to improve its health situation. This is in contrast with the traditional unilateral or dominant role of health professionals (Courtney *et al.*, 1996). The differences between the traditional or

professional approach and a partnership approach, adapted specifically for community projects, are listed in TABLE 2.9.

**TABLE 2.9:** Comparison of the traditional professional approach with a partnership approach of health professionals.

Professional approach	Partnership approach
<b><i>Focus</i></b>	
The problem	Fostering skills and capacity within the community
<b><i>Health Professional's Role</i></b>	
Expert doing <i>to</i> or <i>for</i> the people	Expert working <i>with</i> the people
Decision-maker and problem solver	Facilitator, enabler, resource person sharing leadership and power with community;
<b><i>Community's Role</i></b>	
Passive recipient of service that is defined by the professional	Active and willing participant in self-determination of strengths, problems, solutions
<b><i>Nature of Relationship</i></b>	
Professional is director of the process, instructing or "telling" other what to do	Professional facilitates the community's participation in the relationship; requires ongoing negotiation of goals, roles, and responsibilities;
Standardised interventions are seldom tailored to individual or cultural needs; interventions focus on the problem, not the person	respects individual and cultural differences
<b><i>Goal / Plan</i></b>	
Determined by the professional; focussed totally on the problem	Mutual goal setting; plan of action developed with community who is an active participant
<b><i>Activity / Service</i></b>	
Unilateral action by the professional to diagnose the problem, establish intervention, assess progress, and revise intervention when needed	Joint action and assessment of progress that includes ongoing negotiations of roles and responsibilities; implements the partnership process; emphasises involving families, groups, and/or coalitions as resources
<b><i>Expected Outcomes</i></b>	
The problem is solved or corrected or the community is considered noncompliant	The community is empowered to act on their own behalf; the "problem" may or may not be solved, but the community's capacity is enhanced to prevent future problems or to address them more effectively

(Courtney *et al.*, 1996)

The Community Rural Health Care Project (CRHCP) in India was based on the philosophy that communities will actively participate only if they identify and prioritise their own needs (Arole, 1988). Participatory methodologies are essential to obtain a better understanding of the broad causes of nutritional problems within a community (Young, 1992). In Ethiopia, a participatory approach was used to enable health staff and the community to jointly identify and prioritise health problems and to develop plans to address them (Bhattacharyya *et al.*, 1998). The features and limitations of a participatory assessment approach (where health staff and communities jointly assess the problem) are listed in **TABLE 2.10**.

**TABLE 2.10:** The features and limitations of a participatory approach involving health staff and communities.

Does	Does not
Teach health staff to learn from and listen to community members	Change existing power relationships within a community
Give communities and health staff boundaries and a focus for the discussions (emphasis behaviours)	Create sustained changes in the attitudes and behaviour of health staff towards communities
Use the emphasis behaviours as a way to open discussions of constraints (cultural, social, environmental)	Produce in-depth information on cultural belief systems on any of the behaviours
Use data and community priorities to decide on health activities	Produce quantitative data that can be generalised beyond the communities where it is collected
Begin a better relationship between health staff and communities	Constitute a blueprint for better health planning

(Bhattacharyya *et al.*, 1998)

Nutrition strategies can be developed through participatory research that acknowledges the benefits of a partnership between those with scientific and technical knowledge, and those with personal and cultural knowledge. Through participatory research, (i) research, education and action are combined, (ii) resources are brought into line with the perceived and actual needs of the community, (iii) research is brought into line with the circumstances of the community, and (iv) the communities are brought into line with the realities of resources, data, and the scientific base of knowledge (Davis & Reid, 1999). Rapid assessment procedures facilitates community involvement (Pearson & Kessler, 1992).

Community participation in the planning, implementation and monitoring phases is critical to ensure ownership, sustainability and the success of community-based programmes

(Arole, 1988; UNICEF, 1990; Aubel & Samba-Ndure, 1996).

The community needs to be able to make meaningful decisions (London & Bachmann, 1997), and an important part of the community participatory approach is the facilitation of dialogue. This empowers the community to be involved in the process of identifying and prioritising goals, and establishing strategies (Courtney *et al.*, 1996). The German Ministry of Science developed and introduced an Objective Orientated Project Planning (ZOPP<sup>5</sup>) methodology, which is a useful tool to create a cohesive group from different disciplines during the planning stages of an intervention project. Within a community setting, it creates an opportunity for different groups to work together on a common problem (Gross, 1993).

One aspect of community participation is the selection and training of community members as project staff (Jennings *et al.*, 1991). Incentives can be used to reduce turnover, provide opportunities for learning, create competition, or instill a sense of ownership and pride (Rasmuson *et al.*, 1998). Disagreement on remuneration of project staff can be a constraint for community programmes (Jinabhai *et al.*, 1997).

The CRHCP showed that a community programme becomes resilient if responsibility and authority are delegated to community members, and the community acts to help itself (Arole, 1988). When GM is placed in the hands of the community, it becomes an integral part of the community participatory process (Arole, 1988; Chaudhuri, 1988). On the other hand, when GM is done by health staff and is not used for education, mothers become passive recipients and GM does not result in community actions (Gerein & Ross, 1991).

Drawn from previous experience, fostering the community's sense of ownership was identified as a successful approach for effective community participation (Rasmuson *et al.*, 1998). Although active participation from beneficiaries is a key element of effective programmes, not all of these programmes originated at grassroots level. In Honduras (De Alvarado & Griffiths, 1998) and in India (Arole, 1988; Chaudhuri, 1988), community-based GM evolved from facility-based GM activities. A sense of ownership is an essential element in sustaining community programmes in the long-term (Rasmuson *et al.*, 1998).

For long-term success and optimal community participation, nutrition programmes need the support of national government (Rasmuson *et al.*, 1998). National policies, as a framework for the functions, roles and responsibilities of health committees at community level, are needed (London & Bachmann, 1997).

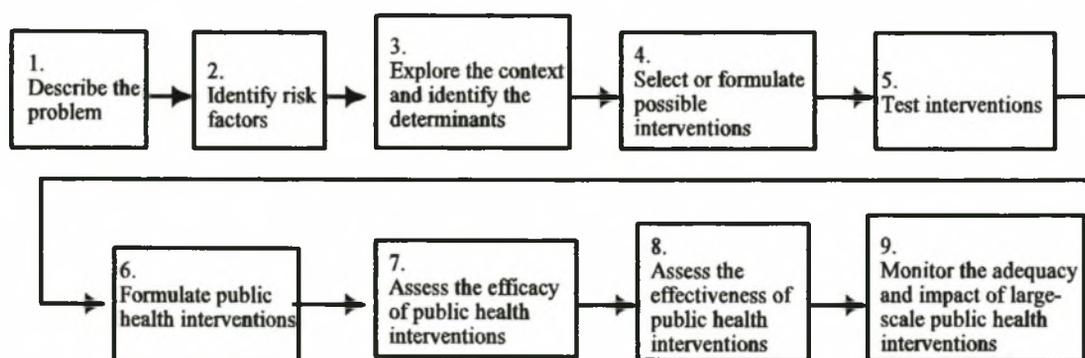
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<sup>5</sup> The German meaning of the acronym is Ziel Orientierte Projekt Planung.

Community participation has several benefits, namely, (i) it creates a sense of ownership, thereby enhancing the sustainability of the project; (ii) it decreases the resistance to project innovations, assists the dissemination of nutrition education messages, and promotes regular and ongoing attendance of project activities; (iii) it decreases dependence on external assistance and promotes self-help in tackling community problems by strengthening community structures and leadership; (iv) it ensures that the project is adapted to local socio-economic and technological conditions, making the project more relevant and acceptable for the community, thereby enhancing sustainability; and (v) it improves access to services to vulnerable groups (Jennings *et al.*, 1991; Courtney *et al.*, 1996; Ndure *et al.*, 1999).

## 2.8 DEVELOPMENT OF NUTRITION STRATEGIES

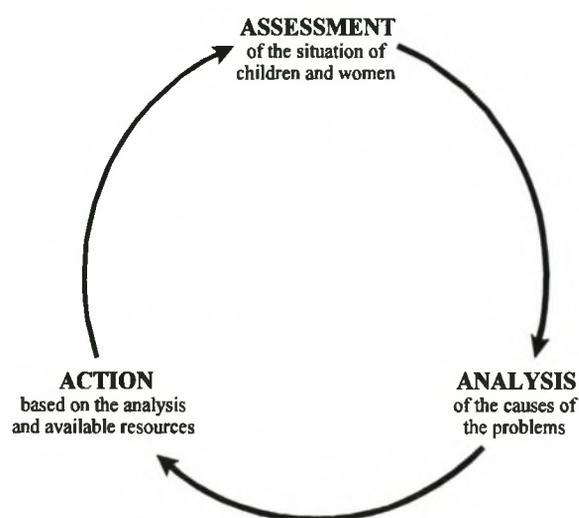
The research process through which interventions are designed to combat malnutrition is a dynamic and iterative step-by-step process as illustrated in **FIGURE 2.10**. Not all these steps are needed in every case. There is a big difference between steps 7 and 8. Efficacy refers to the impact of an intervention under ideal conditions, while effectiveness refers to the impact of an intervention under real world conditions (De Zoysa *et al.*, 1998). Small scale efficacy does not easily translate into large scale effectiveness (Allen & Gillespie, 2001).



**FIGURE 2.10:** Flow diagram showing the conceptual framework for research steps in the development and evaluation of public health interventions (De Zoysa *et al.*, 1998).

Nutrition strategies are mostly situation-specific and should be developed through a participatory decision-making process wherein the problem of malnutrition is *assessed*, its

causes *analysed*, followed by a decision on appropriate *actions*. This process of Assessment, Analysis and Action (Triple-A Cycle) (FIGURE 2.11) should be done within a conceptual framework, taking into account the biological and social causes of malnutrition (UNICEF, 1990). During the assessment phase, nutritional deficiencies are determined through anthropometric, biochemical and clinical indicators (Elder *et al.*, 1996). Nutritional deficiencies which have major health or socio-economic implications usually receive a high priority (Bagchi, 1990). Possible causes for malnutrition include food availability, access and consumption; morbidity; caring practices; health services; food production; water supply and sanitation. Qualitative participatory methodology can yield useful information for several of these aspects. Once the major causes of malnutrition have been defined, a critical evaluation of existing nutrition programmes will assist in identifying the most suitable intervention (Elder *et al.*, 1996). Whatever intervention is decided upon, the project goal and objectives should be clear and realistic. The objectives must be measurable and can be redefined periodically (Levinson *et al.*, 1999).



**FIGURE 2.11:** The triple-A cyclic approach for Assessment, Analysis and Action (UNICEF, 1990)

The triple-A process is cyclical and iterative in that once the actions have been initiated, they are subsequently monitored and evaluated (*reassessment*) so that more effective actions can be taken. This process enables programmes to become more focussed and precise, and permits new factors to be included as they become relevant (UNICEF, 1990). The Iringa project was

the first community-based nutrition programme that was developed within an integrated conceptual framework and reshaped by using the triple-A approach (Jeje, 1997).

Although nutritional problems are multisectoral and multilevel, nutritional programmes that involve many sectors are often difficult to implement and monitor (Bagchi, 1990). A sequence of actions, based on the identification of priority actions and their feasibility, is often more efficient than multisectoral interventions (UNICEF, 1990). It is a good principle to start with a programme that will give quick and visible results (Bagchi, 1990), as this will create an enthusiasm in the community which is important for social mobilisation (UNICEF, 1990).

The context in which a nutrition strategy is planned and implemented usually changes during the course of the programme, thus making it difficult to plan many years in advance. Instead, planning, implementation and monitoring should be processes with the built-in flexibility to accommodate and facilitate modifications. Flexibility means continuously re-planning, which requires the efficient use of information. Nutrition strategies should, therefore, include a built-in monitoring system (UNICEF, 1990) that should be developed during the project planning phase (Levinson *et al.*, 1999). The continuous generation of data will allow for programme modifications and are important for resource management. This process will also lead to the renewed design and implementation of actions based on a better understanding of the problems and practical experiences (UNICEF, 1990). A good communication and information sharing system helps to sustain community interest and will increase community involvement (Jennings *et al.*, 1991). Programmes based on established values and practices are more readily accepted than unfamiliar ones, and their acceptance tends to be more sustainable (Aubel & Samba-Ndure, 1996).

Community programme planning include (i) coordinating with existing programmes; (ii) involving; stakeholders; technical analysis: a variety of research activities with varying degrees of community involvement to obtain the data needed to plan, implement, and monitor and evaluate the programme; (iii) assessment of the feasibility of implementation: needs assessment; and (iv) flexible, iterative planning (Rasmuson, 1998).

## **2.9 MONITORING AND EVALUATION**

Evaluative research is the systematic collection of information on the design, implementation

and effects of projects on targeted populations. The findings are used to change and improve project design and implementation (Rossi *et al.*, 1999) and help decision-makers to make an appropriate choice to either (i) continue with the project (either as it is or with revisions), (ii) expand the project by increasing the target population, (iii) replicate the project in a new setting, or (iv) curtail the project (Levinson *et al.*, 1999). Ideally, the process is divided into an ongoing monitoring system and periodic evaluations with some special studies designed to answer specific questions about the project (Levinson *et al.*, 1999).

### **(i) Monitoring**

Monitoring is concerned primarily with the ongoing collection and review of information on project implementation, coverage and use (Levinson *et al.*, 1999). Monitoring nutrition programmes is important because of (i) the fact that changing human behaviour is often a central objective of nutrition programmes and (ii) the multi-causal nature of malnutrition (Elder *et al.*, 1996).

Well-planned and systematic monitoring can provide information on whether the activities are moving in the right direction and are within the target time-frame. The role of monitoring is to ensure that standards are maintained and resources are being used effectively and efficiently (WHO, 1997). Regular monitoring identifies problems as they arise, areas of concern can be addressed and corrective measures can be taken (Levinson *et al.*, 1999). Three levels of activity should be monitored. Firstly, the activity itself, secondly, a summary of information gathered eg. number of children attended, and thirdly the performance of the worker. Monitoring outputs are useful tools for supervising personnel and evaluating the programme. Monitoring methods include (i) reviewing records and reports; (ii) visits; (iii) checklists; (iv) staff meetings (WHO, 1997).

### **(ii) Evaluation**

Programme evaluation typically involves one or more of five programme domains: (i) the need for the programme (*Needs Assessment*); (ii) the design of the programme (*Assessment of programme theory*); (iii) the programme implementation and service delivery (*Process evaluation*); (iv) the programme's impact or outcome (*Impact/outcome evaluation*); and (v) programme efficiency (*Efficiency assessment*). The evaluation design can be structured around three issues: (i) the questions the evaluation is to answer, (ii) the methods and procedures to be

used; and (iii) the nature of the evaluator-stakeholder interactions during the course of the evaluation (Rossi *et al.*, 1999).

Generally, an initial baseline survey should be followed by one or two midterm evaluations in the mid or late stages of the project and an end-point evaluation is done upon project completion. If the monitoring system indicates that implementation is proceeding reasonably well, the final evaluation can be limited to (i) verification of the monitoring system and (ii) measuring outcomes and impacts. To measure impact, the experimental design should include a control group, randomisation and pre-post analysis. A control group is important to control for historical, maturation, testing and regression to the means effects (Levinson *et al.*, 1999).

A critical phase in evaluation planning is the identification and formulation of the questions the evaluation will address. Good evaluation questions must identify clear, observable dimensions of programme performance that are relevant to the programme's goals and represent domains in which the programme can realistically be expected to have accomplished. Evaluation questions must be (i) reasonable and appropriate; and (ii) answerable (Rossi *et al.*, 1999).

The efficiency assessment answers questions about programme cost and cost-effectiveness (Rossi *et al.*, 1999).

## **2.10 COST EFFECTIVENESS**

The cost (or intensity) of a programme reflects the resources needed per participant (Allen & Gillespie, 2001). The cost of community-based programmes is influenced by the population density, dispersal, and general ease of contact and logistics (Griffiths *et al.*, 1996). Project costs can be grouped in categories such as (i) personnel; (ii) materials and supplies; (iii) utilities; (iv) buildings; and (v) equipment. The cost of capital equipment must be separated from recurrent costs, as recurrent costs are important for project sustainability (Elder *et al.*, 1996). Sustainability is not only a function of recurrent costs (Phillips & Sanghvi, 1996), but also depends on (i) the continued delivery of services and benefits, (ii) programme infrastructure and support, (iii) long-term institutional capacity, and (iv) support from key stakeholders (Levinson *et al.*, 1999)..

The cost of fortification and supplementation programmes is usually lower than for

community-based programmes. It can, however, be misleading to compare programmes only on direct costs. The magnitude of the problem needs to be taken into account. For more realistic comparisons, cost-effectiveness must be taken into consideration (Allen & Gillespie, 2001).

Cost-effectiveness reflects the cost expressed in terms of impact. The benefits of the programme must be known in measurable terms (Allen & Gillespie, 2001). It is often difficult to capture the outcomes of nutrition interventions in monetary units (Elder *et al.*, 1996). The scale of provision and whether or not they are provided alongside other interventions may influence cost-effectiveness (Irwig *et al.*, 1998). The nature of the problem, ability to target and minimize leakage (where food is involved) and the level of capacity to implement the programme needs to be taken into consideration (Allen & Gillespie, 2001).

The major costs for new GM programmes are related to (i) programme design; (ii) programme start-up; and (iii) programme operation. The start-up cost of a GM programme will depend on whether the programme will start from scratch, or whether the GM activities will be incorporated into an existing programme. In case of the latter, the cost will be less and will depend on whether (i) trained CHWs are available; (ii) a good supply and logistics system, regular and supportive supervision, good utilization of available facilities, and a system of regular and effective home visiting exists; (iii) active community participation has been generated; (iv) the existing programme has credibility among the population; (v) effective nutrition education is in place; and (vi) services that address malnutrition are available. The cost of improving GM activities need to be balanced not only against nutritional improvement or impact, but also against other intangible benefits such as (i) the level of participation of mothers in other health care programmes; (ii) the benefit to women by enhancing their problem-solving abilities, helping them to share goals and experiences, and giving them confidence to take on new problems in the community; (iii) communities that are capable of solving their own problems through an assessment, analysis and action process; and (iv) the benefit to future generations when practices improve and when a cultural norm changes to value good growth. Such benefits should be considered, although they cannot be quantified (Griffiths *et al.*, 1996).

## 2.11 CONCLUDING REMARKS

Community-based nutrition programmes should be developed through a process of assessment, analysis and action, within a conceptual framework. A participatory approach should be adopted. Community-based GM programmes seldom function in isolation, and the GM activities are usually integrated with other activities. Within these programmes, GM is used usually for either screening individual children for nutrition rehabilitation, for education and promotional purposes, for nutrition surveillance or as an integrating strategy. Local people are usually trained to perform the community-based activities. The training should have two phases, namely, an initial training followed up by in-services training. The programmes must continuously be monitored, and the outcome must be measured. The assessment of the impact of GM *per se* is difficult, because of the various integrated activities within community-based nutrition programmes and the lack of suitable control areas.

# **Chapter 3**

## **NUTRITION SITUATION ASSESSMENT AND ANALYSIS**

## CHAPTER 3

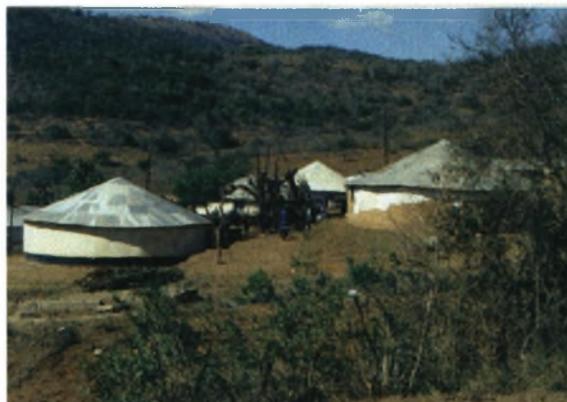
### NUTRITION SITUATION ASSESSMENT AND ANALYSIS

#### 3.1 THE STUDY POPULATION

The study population resided in the Ndunakazi and Mkizwana villages, two neighbouring mountainous rural villages falling under the Kha Ximba tribal authority and situated approximately 60 km north-west of the coastal city of Durban in KwaZulu-Natal. Of the nine provinces in South Africa, KwaZulu-Natal has the second highest infant mortality rate (SADHS, 1998). Each village has a Village Tribal Authority consisting of an Induna (village head) and 2-4 councillors. They liaise with community authorities, of which the Women's League is the most powerful. The next level is the community members. The villages experience the realities and problems faced by most remote communities, which include lack of municipal and health services. The nearest hospital is 30 km away and the nearest clinic 18 km away. The population for the two villages combined is estimated at  $\pm 600$  households comprising of 4 000 - 6 000 people.



**FIGURE 3.1:** The Kha Ximba area.



**FIGURE 3.2:** Traditional housing in the Ndunakazi village.

#### 3.2 INITIATION OF THE STUDY

In 1994, the headmaster of the Ndunakazi Primary School approached the Medical Research Council (MRC) for advice regarding the nutritional needs of children. A meeting with the Programme Leader of the National Research Programme for Nutritional Intervention (NRPNI) of the MRC was arranged. This was the beginning of a long-term partnership between the Ndunakazi community and the MRC.

### **3.3 ESTABLISHMENT OF THE NDUNAKAZI PRIMARY HEALTH CARE COMMITTEE**

The first step was to create a channel of communication between the MRC and the community. This was done by establishing the Ndunakazi Primary Health Care Committee (NPHCC). The MRC did not interfere with the selection process. This ensured that the NPHCC was established within the culture of the people. The community was involved in selecting the committee members, who represented important structures in the community, and included the headmaster of the primary school, the headman of the Ndunakazi village, a traditional healer, the chairperson of a prominent women's organisation, and the chairperson of the school's governing body. The NPHCC was requested to nominate a suitable candidate to act as project manager at community level. The headmaster of the local school was nominated because of his role in the initiation of the process, and his respected and influential position as headmaster within the community.

It was explained to the NPHCC that before any recommendation could be made, the nutritional and health status of the children in the community had to be assessed. The various steps of the situation assessment were explained.

### **3.4 COMMUNITY MEETING**

The second step was to convene a meeting that was attended by community members, the NPHCC and the MRC. During this meeting, the MRC was introduced to the community. It was explained to the community that, before any action could be taken, it was important to assess the nutritional status of the children, and to determine possible causes of the malnutrition as well as constraints within the community. It was agreed that a situation assessment would be done. For this, Zulu-speaking fieldworkers were needed.

### **3.5 RECRUITMENT OF FIELDWORKERS**

The NPHCC was requested to nominate three suitable candidates to be employed as community-based fieldworkers, called nutrition monitors. Although the MRC did not interfere in the selection process, two requirements were stipulated. Firstly, the candidates had to be

literate because completing questionnaires would be part of their responsibilities. Secondly, they had to be fluent in English, to enable them to communicate with the MRC project team.

The candidates who were nominated were three ex-teachers of the Ndunakazi Primary School. In 1993, after they had lost their teaching jobs because they were underqualified, they attended a two-week training course as community health workers at the regional office of the DOH. At the time of recruitment, they were working as volunteers in the community. The candidates, two women and a man, were in their early thirties with some secondary school education, and were Zulu-speaking. Although they were not from the area, they were familiar with the area.

The nutrition monitors attended a three-day training course on the basic principles of health promotion and issues related to how to deal with the community. The training was done by a community health nurse, seconded by the South African Sugar Association (SASA), who had extensive experience in working in rural communities. For the duration of the situation assessment, their salaries were paid by Health Systems Trust.

### **3.6 SITUATION ASSESSMENT**

The situation assessment was carried out in 1994 and included the following:

- i. cross sectional survey including
  - a. socio-demographic and health information collected by questionnaire during house visits to all households (estimated at approximately 600 households)
  - b. anthropometric information (height/length and weight) of all children aged 11 years and younger of all the households visited;
- ii. [a 33% random sample of all households visited was selected for biochemical analysis of blood, urine and stool samples - this is not part of this dissertation and will therefore not be described, but reference will be made to the findings];
- iii. [a 33% random sample of all children of whom blood was taken was selected for a pilot study to determine dietary intake, using an unquantified food frequency questionnaire - this is not part of this dissertation and will therefore not be described, but reference will be made to the findings]
- iv. interviews with prominent figures in the community
- v. focus group discussions (FGD) with women

The situation assessment was done within the UNICEF conceptual framework for malnutrition (FIGURE 1.1), recognising that child malnutrition is caused by a complex interaction of immediate, underlying and basic causes. This dissertation focusses on the nutritional and health situation of children younger than 5 years. The framework for the situation assessment is given in FIGURE 3.3 and the methods of data collection for the various indicators are summarised in TABLE 3.1.

	<b>NUTRITIONAL STATUS OF THE CHILD</b> ▶ prevalence of underweight, wasting, stunting ▶ vitamin A, iron and iodine status* ▶ prevalence of helminthic infections*		
Immediate causes	<b>DIETARY INTAKE</b> ▶ foods usually consumed ▶ pilot dietary survey using an unquantified food frequency questionnaire*		<b>DISEASES</b> ▶ under-5 mortality ▶ history of previous illnesses ▶ perceived health status of children under 5 ▶ prevalence of low birth weight
Underlying causes	<b>HOUSEHOLD FOOD SECURITY</b> ▶ self-reported hunger ▶ food sources	<b>CARE</b> <u>Care-giving behaviours</u> ▶ feeding of young children <u>Care-giver attributes</u> ▶ education ▶ marital status ▶ number of children	<b>HEALTH SERVICES &amp; ENVIRONMENT</b> <u>Utilisation of health services</u> ▶ possession of clinic card ▶ reasons for clinic attendance ▶ role of traditional healers ▶ role of traditional midwives <u>Environmental constraints</u> ▶ water supply ▶ toilet facilities
Basic causes	<b>SOCIO-ECONOMIC PROFILE</b> ▶ sources of income ▶ employment status		<b>COMMUNITY RESOURCES &amp; STRUCTURES</b> ▶ changes in community last 10 years ▶ organisations involved in the community

\* methods are not described in this dissertation, but reference will be made to the findings

**FIGURE 3.3:** The framework for the information collected during the situation assessment.

**TABLE 3.1:** Summary of information collected during the situation assessment, and the method of data collection

Information collected	Method of collection
<p><b>NUTRITIONAL STATUS OF THE CHILD</b></p> <ul style="list-style-type: none"> <li>▶ prevalence of underweight, wasting, stunting</li> </ul>	<p>anthropometric measurements</p>
<p><u>A 33% randomly selected sample of all households included in the house-to-house survey was selected for:</u></p> <ul style="list-style-type: none"> <li>▶ vitamin A and iron status</li> <li>▶ iodine status</li> <li>▶ helminthic infections</li> </ul>	<p>blood sample* urine sample; palpation of the thyroid* stool sample*</p>
<p><b>DIETARY INTAKE</b></p> <ul style="list-style-type: none"> <li>▶ foods usually consumed</li> <li>▶ A 33% randomly selected sample of all children from whom blood samples were taken was selected for a pilot dietary survey</li> </ul>	<p>questionnaire unquantified food frequency questionnaire*</p>
<p><b>DISEASES</b></p> <ul style="list-style-type: none"> <li>▶ under-5 mortality</li> <li>▶ history of previous illnesses</li> <li>▶ perceived health status of children younger than 5 years</li> <li>▶ prevalence of low birth weight</li> </ul>	<p>questionnaire questionnaire interviews; FGD clinic card</p>
<p><b>HOUSEHOLD FOOD SECURITY</b></p> <ul style="list-style-type: none"> <li>▶ self-reported hunger</li> <li>▶ food availability</li> </ul>	<p>questionnaire questionnaire; interviews</p>
<p><b>CARE</b></p> <p><u>Care-giving behaviours</u></p> <ul style="list-style-type: none"> <li>▶ feeding of young children</li> </ul> <p><u>Care-giver attributes</u></p> <ul style="list-style-type: none"> <li>▶ education</li> <li>▶ marital status</li> <li>▶ number of children</li> </ul>	<p>questionnaire questionnaire questionnaire questionnaire</p>
<p><b>HEALTH SERVICES &amp; ENVIRONMENT</b></p> <p><u>Utilisation of health services</u></p> <ul style="list-style-type: none"> <li>▶ possession of clinic card</li> <li>▶ reasons for clinic attendance</li> <li>▶ role of traditional healers</li> <li>▶ role of traditional midwives</li> <li>▶ services of mobile clinic</li> </ul> <p><u>Environmental constraints</u></p> <ul style="list-style-type: none"> <li>▶ water supply</li> <li>▶ toilet facilities</li> </ul>	<p>observation questionnaire; FGD interviews interviews interviews questionnaire; interviews; FGD questionnaire</p>
<p><b>SOCIO-ECONOMIC PROFILE</b></p> <ul style="list-style-type: none"> <li>▶ sources of income</li> <li>▶ employment status</li> </ul>	<p>questionnaire questionnaire; interviews</p>
<p><b>COMMUNITY RESOURCES &amp; STRUCTURES</b></p> <ul style="list-style-type: none"> <li>▶ changes in community last 10 years</li> <li>▶ organisations involved in the community</li> </ul>	<p>interviews, FGD FGD</p>

\* methods are not described in this dissertation, but reference will be made to the findings

### 3.6.1 Methods

#### 3.6.1.1 Cross-sectional survey

Two nutritionists with extensive experience in field surveys developed a questionnaire following the steps listed below.

- Step 1. Variables that were within the scope of the study were listed. The literature and existing questionnaires were used as a guide.
- Step 2. Simple, concise and very specific questions were formulated. One question was asked at a time. Leading questions and loaded questions were avoided. The relevancy of each question was looked into.
- Step 3. The questions were ordered, with the demographic questions first and the more sensitive questions later. Questions regarding a similar topic were grouped together to allow for a logical flow of questions and to obtain continuity. For close-ended questions, mutually exclusive and exhaustive categories were defined.
- Step 4. The questionnaire was pre-tested on a sample of ten households before it was finalised.

The questionnaire was comprehensive and only information on immediate, underlying and basic causes of child malnutrition, as indicated in **FIGURE 3.3**, will be reported in this dissertation.

A nutritionist who had extensive experience in training fieldworkers trained the nutrition monitors in the completion of questionnaires. A scientist specialising in the field of anthropometry trained them to take anthropometric measurements. The training was done over a period of four days. The training included a pretest which included house visits.

The three nutrition monitors visited all accessible households. All households with children 11 years or younger were included in the survey. The mother or principal caretaker (a member of the household, usually the grandmother of the child, in whose care the child was during the day) was interviewed by the nutrition monitor in her mother tongue (Zulu) using the structured questionnaire (**Appendix A**).

During these house visits, anthropometric measurements of weight and height of all children 11 years and younger were taken without shoes and in light clothing as described by Jelliffe & Jelliffe (1989). Weight was measured to the nearest 50 grams on a calibrated battery

operated electronic load cell digital scale (UC-300 Precision health scale). The length of children younger than 2 years was measured in a recumbent position on a baby measuring board to the nearest 0.1 cm. The height of children older than 2 years was measured to the nearest 0.1 cm using a wooden board with a fixed measuring tape and a moveable headpiece. Each measurement was taken three times.

Weight-for-age, height-for-age, and weight-for-height were expressed as Z-scores using the NCHS median as reference (Hamill *et al.*, 1979). Children with height-for-age, weight-for-age and weight-for-height Z-scores more than two standard deviations below this reference median were classified as stunted, underweight and wasted, respectively (Gorstein *et al.*, 1994). The severity of the prevalence of underweight, stunting and wasting was defined according to the WHO classification (Gorstein *et al.*, 1994), as tabulated in TABLE 3.2.

**TABLE 3.2:** Criteria for assessing the severity of undernutrition<sup>a</sup> in populations<sup>b</sup>.

Indicator	% prevalence			
	Low	Medium	High	Very high
Underweight	< 10	10.0 - 19.9	20.0 - 29.9	≥ 30.0
Stunting	< 20	20.0 - 29.9	30.0 - 39.9	≥ 40.0
Wasting	< 5	5.0 - 9.9	10.0 - 14.9	≥ 15.0

<sup>a</sup> Undernutrition defined as < 2 SD of the median of the reference population.

<sup>b</sup> Age < 60 months  
(Gorstein *et al.*, 1994)

Data collected by questionnaire was computer coded and analysed using SAS version 6.1. The data is presented as descriptive data, with continuous data expressed as means and standard deviation (SD), and categorical data as frequencies.

### 3.6.1.2 Interviews and Focus group discussions

Qualitative research explores the people's subjective understanding of their everyday lives (Pope & Mays, 1999) and is based on the concept that the opinions of individuals are as valuable as statistical data (Gross & Gross, 1994). A strength of qualitative research is that it studies people in their natural setting (Pope & Mays, 1999). Qualitative information was obtained through interviews and FGD, with the objectives to (i) collect information on the

perception and awareness of the community regarding the health status of children under 5 years, and (ii) identify the main problems affecting the children's health status, as perceived by the community. The interviews and FGD were conducted by the three nutrition monitors and two community nurses seconded by SASA. The actual assessment in the community was carried out over a period of three days.

**(i) Interviews with key informants in the community**

Key informants in the community were interviewed by the nutrition monitors by means of a semi-structured interview<sup>6</sup> with open-ended questions. The semi-structured questionnaires that were used during these interviews were developed according to the guidelines of Gross & Gross (1994) and within the framework given in **FIGURE 3.3**. Statistical representativeness is not sought in qualitative research (Britten, 1999). Using the guidelines of Gross & Gross (1994), the MRC project team, the project manager and NPHCC identified village heads, shop-owners, traditional healers, traditional midwives and clinic staff as suitable key informants. Topics that were covered in the interviews with the various key informants are indicated by the shaded blocks in **TABLE 3.3**.

**TABLE 3.3:** Topics that were covered in the interviews with various community members during the situation assessment in 1994.

	CL	AC	TH	TM	SO
Changes in the community over the last 10 years					
Main problems in the community					
Organisations involved in the community					
Service supplied by the mobile clinic					
Service supplied by traditional healers					
Service supplied by traditional midwives					
Health situation of children under 5					
Food items sold at the shops					

CL : community leaders (2)                      TH:traditional healer  
 AC : assistant of a private mobile clinic      TM:traditional midwives (2)  
 SO : shop owners (2)

Topics covered with various community representatives are indicated by the shaded blocks.

<sup>6</sup>A semi-structured interview is an informal but guided interview session, in which some of the questions are predetermined, but new questions or a line of questions can arise during the interview, in response to answers from those interviewed (*Guidelines for Participatory Nutrition Projects*, 1993).

Questions used during the interviews were adapted from Gross & Gross (1994) for local conditions, and focussed specifically on factors affecting the health status of children under 5 years (**Appendix B**). The questions were compiled in English and were translated into the local language (Zulu).

The interviewers were trained by Dr Ursula Gross from the SEAMEO-TROPMED Community Nutrition Training Program in Jakarta, Indonesia. During the training session the Zulu version of the questions was translated back into English to establish whether the Zulu version had the same meaning as the original version. Where there was a discrepancy, the question was rephrased until all participants agreed that they understood the question in the same way. The two-day training session included a pre-test.

The NPHCC was asked to identify suitable candidates for the interviews. The project manager played an important role in ensuring that the recruitment of the candidates was within the cultural context of the community. It was recommended that at least two representatives of the community concerning the same topic be interviewed (Gross & Gross, 1994). The leaders of the two respective villages, the assistant from a private mobile clinic operating in the area, a traditional healer, two traditional midwives, and two shop-owners were recruited.

After each interview the nutrition monitors translated the information into English. The project leader scrutinised the English version and cleared all uncertainties. The respondents could not always provide the needed information and those questions were discarded when summarising the data. Survey forms provided by Gross & Gross (1994) were adapted and used to summarise the information by topic.

## **(ii) Focus group discussions**

FGD were held with three groups of mothers with children younger than 5 years, and three groups of women from a prominent women's organisation (Women's League).

Topics for the FGD were identified using the guidelines of Gross & Gross (1994), within the framework given in **FIGURE 3.3**. Topics discussed with the mothers were problems experienced within the community, and the health situation of children younger than 5 years (**Appendix C**). Topics discussed with the Women's League were problems experienced within the community, water supply and usage, and organisations involved in the community (**Appendix C**). The questions were compiled in English and translated into the local language.

Conducting FGD through direct translations reduces the natural flow of discussion (Dawson & Manderson, 1993). The FGD were therefore conducted in the local language. Although it is preferable that professionals should facilitate the FGD (Gross & Gross, 1994), this function was performed by the nutrition monitors. They were trained by Dr Ursula Gross. During the training session the Zulu version of the questions were translated into English to establish whether the Zulu version had the same meaning as the English version. Where there was a discrepancy, the question was rephrased until all participants agreed that they understood the question in the same way. The two-day training session included a pre-test.

Convenience or purposive sampling (selecting community members who will provide the best information) is the most common and simplest method for selecting participants for a FGD (Dawson & Manderson, 1993). Using the guidelines of Gross & Gross (1994), the MRC guided the NPHCC to identify suitable candidates for the FGD. The project manager played an important role in ensuring that the recruitment of the candidates was within the cultural context of the community. Participants within a group were all more or less the same age. People known to be in conflict with each other were not included in the same group, and dominating or passive people were excluded.

The two different FGD ran simultaneously on three consecutive days. Each discussion group was facilitated by a nutrition monitor while another person made notes. NRPNI researchers (one per group) sat in on all the FGD. Because of the language barrier they only observed the process and gave advice when asked by the group's facilitator.

Because of the inexperience of the nutrition monitors, they did not always succeed in facilitating an in-depth discussion among the participants and, at times, they tended to ask the mothers individually. This is not seen as a major problem because the data that was collected was neither complex nor controversial. Each group discussion was followed by "mapping".

The mothers did a calendar mapping of the seasonality of diseases. A piece of paper, with columns for each calendar month, was put on the ground. The mothers were asked to identify the rainy and dry seasons, as well as the warm and cold seasons. These were indicated by pictures drawn by those mothers who could draw, e.g. a sun for the warm season, and raindrops for the wet season. All mothers were then asked to put stones in the appropriate columns for the diseases identified during the focus group discussion.

The women of the Women's League mapped all organisations involved in the community. A piece of paper was put on the ground on which the mothers drew pictures of all

organisations involved. Illiterate mothers were assisted by the rest of the group.

After each group discussion the recorded notes were translated into English, clarified, and expanded in consultation with the nutrition monitors who facilitated and observed the FGD. The project leader scrutinised the English version and cleared all uncertainties. The information was analysed according to the guidelines given by Dawson & Manderson (1993). Statements that did not make sense were deleted. Key issues were identified by code words in the margins of the page. A list of code words down the side of the page was used to group the statements into categories according to the topic of interest.

### **3.6.2 Results**

#### **3.6.2.1 House-to-house visits**

The three nutrition monitors visited all accessible households. The questionnaire was completed for all households with children 11 years and younger (n=493). Data collected in 1998 showed that approximately 12% of households did not have children 11 years and younger (unpublished data), and the population in the two villages was therefore estimated at 560 households which was slightly lower than the 1994 estimation of 600 households. For the 493 households included in the situation assessment, 75% (n=368) of the interviews were with the mother and 25% (n=125) with the caregiver.

#### ***Environmental conditions***

Environmental conditions are given in **TABLE 3.4**. In 1994, there were no taps in the area. Drinking water was obtained mostly from the river. Although most people realised that the water from the river was contaminated and unsafe for human consumption, less than 10% of households usually boiled the water before drinking it. Approximately one-third (38%) of the households had access to a pit toilet; 62% had no toilet facilities. Garbage was usually dumped and then burned.

**TABLE 3.4:** Environmental conditions of the households (n=493) in the Ndunakazi and Mkizwana villages, as determined during the situation assessment in 1994.

<b>Source of drinking water (%)</b>	
River	84
Borehole	2
Both river and borehole	14
<b>Boiled the drinking water (%)</b>	
Yes	7
No	75
Sometimes	18
<b>Toilet facilities (%)</b>	
Pit toilet	38
None	62

#### *Caregiver and maternal attributes*

Caregiver attributes and maternal characteristics are given in **TABLE 3.5**. Of the 368 mothers (excluding the caregivers) included in the survey, 55% had four or more living children. Thirty-two percent of mothers had lost a child under the age of 5 years. Most of these deaths occurred during infancy. Half of the mothers did not know the cause of death. Where the cause of death was known, diarrhoea was associated with two-thirds of the deaths. Of the married women (n=184), one-third of the husbands were unemployed. The men were mainly migrant workers, working as labourers.

**TABLE 3.5:** Caregiver attributes and maternal characteristics in the Ndunakazi and Mkizwana villages, as determined during the situation assessment in 1994.

<b>Educational level of the caregiver (n=493) (%)</b>	
no formal schooling	36
primary school (grades 1-7)	50
secondary school (grades 8-12)	14
<b>Marital status of the mother (n=368) (%)</b>	
married, only wife	49
married, more than one wife	11
single	30
divorced	1
widowed	9
<b>Number of living children per mother (n=368) (%)</b>	
1	16
2-4	43
5-9	39
≥10	2
<b>FOR MARRIED WOMEN (n=222)</b>	
<b>Employment status of husbands (%)</b>	
Employed, works locally	3
Employed, home every evening	16
Employed, home every weekend	35
Employed, home every month	11
Employed, home seldom	2
Unemployed	33
<b>Type of employment of the husbands (%)</b>	
Unemployed	33
Labourer	58
Other	5
Unknown	4

***Feeding of young children***

Breastfeeding was initiated in 98% of infants. The main reason for stopping to breastfeed was the mother's perception that she had insufficient milk. Solid foods were introduced at an average age of  $2.8 \pm 0.8$  months. For 62% of infants, a porridge made with maize meal was the first solid food given.

***Household food security***

Nearly all mothers indicated that they obtained food from home-gardens, although limited, in addition to the food that they bought. The foods consumed mostly were porridge made with

maize meal (either a soft or a stiff porridge), bread and rice. Seventy-two percent of households reportedly did not always have enough food for everybody in the household. In times of food shortage, it was usually the children younger than 11 years that went hungry.

### *Socio-economic conditions*

Only 50% of households had a regular cash income, while 15% of households had no cash income at all. For those households with a cash income, the main source of money was the husband's income (58%), pensions (24%) and the mother's own income (21%).

### *Child morbidity*

Of the total sample of 799 children aged 11 years and younger, 2% had a previous history of tuberculosis, 12% had had measles, and 2% had had bilharzia. When infants presented with diarrhoea, milk feeds were stopped for 29%, and solids foods were stopped for 45%.

### *Utilisation of health services*

At the time of the survey, 9% of infants had not yet been taken to the clinic. Of the remaining 91% of the infants, the main reason (73%) for attending the clinic was for immunisations, when, at the same time, the child was usually weighed. Only 3% of infants were taken to the clinic specifically for GM. The proportion of children in possession of an RTH card is shown in **TABLE 3.6**. No information was obtained on how complete these cards were.

**TABLE 3.6:** The proportion of children in possession of an RTH card for the various age categories in the Ndunakazi and Mkizwana villages, as determined during the situation assessment in 1994.

	<u>Age category</u>							
	<b>0-6 m</b> (n=50)	<b>6-12 m</b> (n=49)	<b>12-18 m</b> (n=53)	<b>18-24 m</b> (n=46)	<b>2-3 y</b> (n=89)	<b>3-4 y</b> (n=80)	<b>4-5 y</b> (n=96)	<b>5-6 y</b> (n=78)
<b>In possession of a growth chart (%)</b>	78	83	68	70	58	34	36	19

### *Anthropometric status*

The prevalence of low birth weight (< 2 500 g) for those children whose birth weight was available (n=173), was 8.1%. The anthropometric status of the children, with the preschool children grouped into age categories as suggested by WHO (1983), is given in **TABLE 3.7**.

According to the cut-off points of WHO (Gorstein *et al.*, 1994) (TABLE 3.2), the severity of malnutrition in terms of underweight, wasting and stunting was low. The prevalence of stunting doubled from the 6-12 month to the 12-24 month age category. Thereafter, the prevalence of stunting remained fairly constant.

**TABLE 3.7:** The proportion of children who were either underweight, wasted or stunted in the Ndunakazi and Mkizwana villages, as determined during the situation assessment in 1994.

	<u>Age category</u>						
	0-<6 m (n=50)	6-<12 m (n=49)	12-<24 m (n=99)	2-<4 y (n=169)	4-<6 y (n=174)	6-<9 y (n=152)	9-<12 y (n=108)
<b>Underweight<sup>a</sup> (%)</b>	2	4	8	5	1	4	4
<b>Wasted<sup>b</sup> (%)</b>	0	0	4	2	0	1	1
<b>Stunted<sup>c</sup> (%)</b>	6	11	20	15	17	24	18

<sup>a</sup> Weight-for-age Z-score < -2

<sup>b</sup> Weight-for-height Z-score < -2

<sup>c</sup> Height-for-age Z-score < -2

### 3.6.2.2 Interviews and Focus Group Discussions

The results of the interviews and FGD are presented combined and according to the topic.

#### (i) Changes in the community within the last 10 to 15 years

##### *Family structure*

In the past, the extended family included the husband, his few wives, their children and grandparents. Currently, there is a shift towards smaller families, and the number of teenage pregnancies are increasing.

##### *The role of women in the community*

In the past, women were involved mostly in housework and working in the fields. Currently, women are involved in sewing, gardening, knitting and beadwork; and they are actively involved in community organisations. The number of employed women has increased.

**(ii) Main perceived problems**

In **TABLE 3.8**, the shaded blocks indicate the problems listed by the various respondents. A lack of clean water, unemployment, lack of health facilities, poverty and a poor transport system were seen as the main problems. Other problems listed were illnesses, poor education facilities, social factors, a shortage of food, and a lack of electricity, toilets and telephones.

**TABLE 3.8:** The main problems listed by the various respondents during the interviews and focus group discussions in 1994.

	CL	CL	M	M	M	WL	WL	WL	MC	TH	TM	TM	SO	SO	HM
Lack of clean water															
Lack of health															
Unemployment															
Poverty															
Poor transport/roads															
Illnesses															
Poor education															
Social factors															
Food shortage															
Lack of electricity															
Lack of toilets															
Lack of telephones															

CL: community leader (2)

M: focus group discussion with mothers (3)

WL: focus group discussion with Women's League (3)

MC: helper at private mobile clinic

TH: traditional healer

TM: traditional midwife (2)

SO: shop owner (2)

HM: school headmaster

Problems listed by the various respondents are indicated by the shaded blocks.

**Water**

At the time of the survey, the main source of drinking water was the Umgeni river, which, at times, was heavily contaminated. The contamination of the water was aggravated by insects during the dry season, floods during the rainy season, and oil leakage from tractors collecting sand. The river was also used for swimming, bathing and washing of clothes. Although the river water was dirty and often considered unsafe for human consumption, people seldom boiled the water before drinking it. They usually experienced a shortage of water during the dry winter season. Most people spent between a half and two hours per day fetching water.

### ***Health services***

There were no health facilities in the area. A government mobile clinic was scheduled to serve the area once a month. Previously, a fee was charged, but at the time of the survey, the service at the mobile clinic was free of charge. Some people had negative feelings about the mobile clinic because of the irregularity of the service, impatience of the clinic staff, and long distances they had to walk to reach the service point. Emergencies and very sick people were difficult to take care of. Immunisation was dependent on the mobile clinic and immunisation campaigns.

### ***Unemployment***

Unemployment in the community was high. Resources were limited, people did not have fixed assets and were not exposed to job opportunities. There was an increase in unemployment because of retrenchments and companies closing down. Those who were employed worked mainly in the cities and on nearby farms. An increasing number of women were seeking employment outside the community, mainly in big industries and, to a lesser extent, as domestic workers in the nearby towns and big cities.

### ***Poverty***

The high unemployment rate and limited resources resulted in poverty within the villages. For many households a pension was the only income. Poverty was aggravated by the fact that many women were widowed because of the unrest and high crime rate in the country.

### ***Poor transport system and roads***

The transport system was very poor. Transport in and out of the area was only available once a day. Taxis refused to enter the area because of the poor condition of the road. The road leading into the community was constructed about 30 years ago, where after it has gradually been washed away by heavy rains during the rainy seasons.

### ***Illnesses***

Many people were ill. Various illnesses were listed as major problems.

### ***Poor education system***

The education facilities were unsatisfactory. There was no crèche, preschool or secondary

school. There was an urgent need for adult education as many of the mothers were illiterate. The facilities at the primary school were inadequate and the school was overcrowded because of a shortage of classrooms.

### ***Social factors***

The area lacked social development. There was no police security or police station. A lack of recreation facilities for the youth was reflected by alcohol abuse, lawlessness and teenage pregnancies.

### ***Food shortage***

A shortage of money prohibited the people to buy sufficient food. The home production of foods was decreasing. Maize and beans were the main crops planted. Livestock owned were cattle, goats and chickens. A shortage of water, soil erosion, rocky areas, stray animals, unfenced fields and insufficient garden tools hampered agricultural activities. There was no credit system available for agricultural activities.

### ***Lack of electricity***

Electricity (card system) had recently been installed in some houses. There were, however, many households who did not have access to electricity.

### ***Lack of toilets***

There was no sewage system. Some people had access to pit toilets.

### ***Lack of telephones***

There was only one telephone in the area which had recently been installed for the shop owner.

### **(iii) Health status of children under 5 years**

Some mothers considered their children to be healthy. Others felt that their children were weak and too thin, because of a lack of vitamins and a shortage of food. The main illnesses of children under 5 years, as reported by the respondents, are indicated by the shaded blocks in **TABLE 3.9.**

**TABLE 3.9:** The main illnesses of children under 5 years reported during the interviews and focus group discussions.

	M	M	M	MC	TH	TM	TM
Diarrhoea							
Fever							
Sores							
Worms							
Weakness							
Stomach pain							
Skin rash							
Coughing							
Headache							

M: focus group discussion with mothers (3)

MC: helper at private mobile clinic

TH: traditional healer

TM: traditional midwife (2)

Illnesses listed by the various respondents are indicated by the shaded blocks.

Diarrhoea was considered the biggest health problem affecting the children. Other prominent health problems were fever because of an infection and sores on the body. The causes and treatment of these illnesses were discussed during the FGD with the mothers. Diarrhoea, fever and sores were reported by at least two of the three groups, and are summarised below.

### ***Diarrhoea***

Diarrhoea was a problem throughout the year. The dirty water was given as the main cause. Children with diarrhoea were often given a home-made solution made from boiling water, salt and sugar. If the diarrhoea persisted for longer than two days, the children were often taken to a clinic, from where the severe cases were referred to a hospital. Undesirable practices, such as giving an enema and withholding liquids and solid foods, were often associated with diarrhoea.

### ***Sores on the body***

Sores on the children's bodies and heads were more prevalent during the hot summer months. Mothers believed that the sores were caused by mosquitos and small insects. The sores were usually washed with a household bleaching agent or treated with herbs. When these treatments failed the child would be taken to the clinic.

### ***Fever***

Children presented with a fever, caused by an infection or a cold, usually during the latter half of the dry season. Children presenting with a fever were usually given Panado or, to a lesser extent, an enema or herbal treatment. If there was no improvement after approximately two days or if the child was very ill, the child would be taken to the clinic.

#### **(iv) Source of information on how to treat illnesses**

The treatment of most illnesses were considered to be general knowledge. Advice was often obtained from parents, neighbours and grandmothers. Some information was obtained from the clinic staff. Sick children were usually taken to a clinic, doctors or hospital within 2-3 days. Children were taken to the clinic mainly for immunisation and sometimes for GM. The mothers considered the clinic to be important for the health of their children. They preferred the clinic above the traditional healers. At the clinic, medicines were given to the sick, whereas the enemas given by the traditional healers often worsened the condition of the child.

#### **(v) Organisations involved in the community**

Several organisations involved in the community were listed, including the Department of Agriculture, Escom (electricity), Umgeni Water Board (water), welfare (pensions), church/religious groups, MRC, Women's League and the community garden organisation.

#### **(vi) Community development on its own**

Various activities within the community were listed. A community garden had been started. There was a "stokvel" for food, costing R25 per month, and a burial society, costing R5 per month. Beadwork and making grass mats provided income for some. The participants expressed a need for assistance to help people to use their knitting, crocheting, and sewing skills for income generation. There was a need within the community for assistance to improve their situation. They requested that organisations meet with them to discuss possible solutions to their problems. The people in the community were willing to come together and contribute (financially and in other ways) in order to be helped.

**(vii) The new private mobile clinic**

In addition to the government mobile clinic that serviced the area once a month, a mobile clinic was started by a nursing sister in her private capacity about one month before the survey. Her assistant with whom the interview was done, could supply only limited information.

The mobile clinic serviced the area twice a week. The service point was at the school. The mobile clinic was attended by 7-10 people per day. Whereas the service at the government mobile clinic was free of charge, the private mobile clinic charged a fee (R10 per adult; R8 per child) which included the consultation and medication given. Although GM was done, children attended the clinic mainly because they were coughing or had diarrhoea. Various baby products were available at the normal price, but these products were seldom bought. There was no co-operation between the private mobile clinic, the traditional healers or traditional midwives. This service was stopped shortly after the survey.

**(viii) The role of the traditional healers**

There were approximately four male and six female traditional healers and one herbalist in the two villages. People visited them mainly because of stomach pains and swollen, painful legs. The fee charged depended on the illness. Certain illnesses, e.g. worms and rashes, were not treated by them. An enema was given for several illnesses, especially stomach pains and diarrhoea. "Medicines" provided were usually made from herbs, and to a lesser extent from leaves and oils. The "medicines" were charged for. They did not encounter major problems with delivering a service. At the time of the survey, they did not co-operate with the clinic staff, but they were willing to work with them in order to manage the area's health problems.

**(ix) The role of the traditional midwife**

The role of the traditional midwife was becoming smaller. Since the antenatal care at the clinic was free of charge, an increasing number of pregnant women attended the clinic and delivered their babies in hospital. Some mothers preferred the assistance of a midwife because the hospitals were far away and they were afraid of going to hospital. The traditional midwives and the traditional healers worked together. One of the interviewed midwives co-operated with the

clinic staff. Both had a positive attitude towards co-operating with health personnel.

#### **(x) The role of the shops**

Food items bought most often in the shops included sugar, soup (Imana soya), bread (white/brown), vegetables (cabbage/tomatoes/potatoes/onions), milk/maas, cold drinks, tea, tinned fish, maize meal, beans, rice, flour, tinned food and cooking oil. Full cream milk powder, and a variety of infant formula milk and infant cereals were available in the shops. Iodised salt was not available. One of the shops sold meat/fish/chicken. Fresh milk, cheese, vegetables and fruit were delivered once or twice a week. Cheese was not ordered regularly because the people did not buy it (too expensive). Milk was stored in a gas fridge in the one shop, and on a shelf in the other. It seemed as if the food prices were higher during the winter months. A credit system (a "book" system) was available at both shops. A variety of over-the-counter medicines was available in the shops.

#### **(xi) Expectations**

From the interviews and FGD it became clear that the community had various expectations of better living conditions. These included clean water, sanitation, electricity, tarred roads, telephones and good education for their children. In addition, respondents felt that, among others, CHWs, a clinic and adult education were needed.

It was evident that the community had a positive attitude towards solving their problems, provided guidance was given. Approximately two-thirds of the respondents felt that the community should discuss the health problems in the area to find solutions.

### **3.6.3 Summary of main findings**

The main findings, within the framework of the situation assessment, are summarised in **FIGURE 3.4.**

<p><b>NUTRITIONAL STATUS OF THE CHILD</b></p> <ul style="list-style-type: none"> <li>▶ Prevalence of stunting doubled during the second year of life</li> <li>▶ 45% preschool children were marginally vitamin A deficient*</li> <li>▶ 24% preschool children were anaemic*</li> <li>▶ 77% preschool children had urinary iodine concentrations &lt; 10 µg/dL #</li> <li>▶ helminthic infections were prevalent §</li> </ul>			
<b>IMMEDIATE CAUSES</b>	<p><b>DIETARY INTAKE</b></p> <ul style="list-style-type: none"> <li>▶ foods mostly consumed were maize, rice and beans</li> <li>▶ foods of animal origin, and fruits and vegetables were seldom consumed*</li> </ul>	<p><b>DISEASES</b></p> <ul style="list-style-type: none"> <li>▶ one-third of the mothers lost a child before the age of 5 years</li> <li>▶ diarrhoea was the main perceived illness</li> </ul>	
<b>UNDERLYING CAUSES</b>	<p><b>HOUSEHOLD FOOD SECURITY</b></p> <ul style="list-style-type: none"> <li>▶ 72% of households did not always have enough food</li> <li>▶ crops mostly planted were maize and beans</li> <li>▶ foods available in the shops were limited</li> </ul>	<p><b>CARE</b></p> <p><u>Care-giving behaviours</u></p> <ul style="list-style-type: none"> <li>▶ complementary foods were given too early</li> <li>▶ main reason for stopping breastfeeding was insufficient milk</li> <li>▶ undesirable practices when child has diarrhoea</li> </ul> <p><u>Care-giver attributes</u></p> <ul style="list-style-type: none"> <li>▶ low maternal education</li> <li>▶ husbands were mainly migrant labourers</li> </ul>	<p><b>HEALTH SERVICES &amp; ENVIRONMENT</b></p> <p><u>Utilisation of health services</u></p> <ul style="list-style-type: none"> <li>▶ &lt; 50% of children older than 2 years were in possession of a clinic card</li> <li>▶ immunisation main reason for clinic attendance</li> <li>▶ most children were growth monitored on immunisation dates only</li> </ul> <p><u>Environmental constraints</u></p> <ul style="list-style-type: none"> <li>▶ river water was the main source of drinking water</li> <li>▶ few mothers boiled water before consumption</li> <li>▶ 62% of households had no access to toilet facilities</li> </ul>
<b>BASIC CAUSES</b>	<p><b>SOCIO-ECONOMIC PROFILE</b></p> <ul style="list-style-type: none"> <li>▶ 15% of households had no cash income</li> <li>▶ 33% unemployment rate</li> </ul>		<p><b>COMMUNITY RESOURCES &amp; STRUCTURES</b></p> <ul style="list-style-type: none"> <li>▶ poor road conditions and transport system</li> <li>▶ no telephones</li> <li>▶ only a few households had electricity</li> </ul>

\* Oelofse *et al.*, 1999; # Benadé *et al.*, 1997; § Evans *et al.*, 1997

**FIGURE 3.4:** Summary of main findings, within the framework of the situation assessment.

The prevalence of stunting, an indicator for long-term deficiencies, doubled from the first to the second year of life in children. Various factors could have contributed towards this, but probably the most important ones being undesirable complementary feeding practices during infancy and early childhood, and diarrhoeal infections.

Solid foods were introduced too early. The first solid food given to infants was usually a porridge made with maize meal. The latter contains inadequate micronutrients if used on its own.

Nearly half (45%) of the preschool children were marginally vitamin A deficient, 24% were anaemic, and 77% had low urinary iodine concentrations (Oelofse *et al.*, 1999). The high prevalence of vitamin A and iron deficiencies was of concern as this could have severe developmental implications during an age when children are most vulnerable. These micronutrient deficiencies suggested a poor quality of dietary intake. A pilot dietary assessment undertaken in the area showed that children consumed a limited variety of foods. Staple foods were a porridge made with maize meal, rice and beans. Animal foods and fruit were seldom consumed. *Imifino* (a collection of locally grown dark green leafy vegetables) was the only  $\beta$ -carotene-rich food consumed on a regular basis (Oelofse *et al.*, 1999). During the pilot dietary survey, the mothers indicated that the type of food was not as important as the satiating effect it had, indicating a lack of nutritional knowledge (Oelofse *et al.*, 1999). Even if an active promotion campaign to increase the intake of foods rich in iron and vitamin A was embarked on, the effect would be limited because of, firstly, the cost of animal products, and, secondly, the unavailability of most fruits and vegetables in the area. Crops planted were mainly maize and beans. Foods available in the shops were limited, and cabbage, tomatoes, potatoes and onions were the only vegetables sold.

Diarrhoea was the most prevalent illness. Environmental conditions, such as the lack of toilet facilities and clean water, could have contributed to this. Water for household use was collected from the river, which was also used for swimming, bathing, and washing. This made the water from the river a potential health hazard. Although most of the mothers realised that the river water was unsafe for human consumption, only 10% boiled the water before consumption, thereby increasing the risk for diarrhoea. The treatment of diarrhoea was also not sufficient. Unfavourable practices, such as giving an enema and withholding solid foods, indicated a need for nutrition information. A platform for providing nutrition education was needed.

The doubling in stunting during the second year of life suggested that malnutrition started during the weaning period. The weaning period as critical period was further supported by the finding that approximately one-third of mothers lost a child before the age of 5 years, with most of these deaths occurring during infancy. It could be argued that some of these infant deaths could have been prevented if the child was growth monitored regularly from an early age. Anthropometry is universally accepted as the most useful tool for assessing the nutritional status of infants and small children (Allen & Gillespie, 2001), and weight is a sensitive indicator for small changes in nutritional and health status (Jelliffe & Jelliffe, 1989). Growth monitoring from an early age is therefore important.

Although more than 70% of children under 2 years of age were in possession of a RTH card, most children in the area were growth monitored mainly on immunisation dates. Only 58% of 2-year-old children, and 34% of 3-year-old children could present a RTH card. For optimum growth of children, regular GM should be promoted (Griffiths *et al.*, 1996). However, it is doubtful whether the promotion of GM alone would have an impact in these villages, as there were no fixed health facilities. Although a mobile clinic was scheduled to serve the area once a month, this service was irregular and many mothers had to walk long distances to reach the service point. Attending the nearest clinic, which was 18 km away, was difficult because of the poor condition of the roads, and the poor transport system. Transport in and out of the area was available only once a day, meaning that the mother would be out of the area the whole day to visit the clinic. It would be difficult to motivate a mother of a healthy child to take her child to the clinic only for weighing.

In these villages, the prevalence of stunting had not yet reached severe proportions. Extensive micronutrient deficiencies were, however, prevalent. This emphasised the urgency for action to prevent these micronutrient deficiencies from manifesting as severe stunting and its associated consequences. From a nutritional point, the situation assessment identified a need for regular GM of infants and small children, increased availability of foods rich in micronutrients, and nutrition education.

The findings were presented to and discussed with the NPHCC. It was unanimously decided to hold a workshop with a group of community representatives to discuss the findings.

### 3.7 WORKSHOP WITH COMMUNITY REPRESENTATIVES

A four-day workshop was held with community representatives, with the objective to use the information obtained during the situation assessment to develop a plan of action to address the identified nutritional problems in the community. The workshop was based on the ZOPP methodology (Gross, 1993). This created an opportunity for the community to seek solutions for their problems in an open and participatory manner. The partnership between the community representatives and MRC researchers allowed both parties an equal opportunity to contribute towards prioritising the needs and planning the actions to be taken. This ensured that the project was developed based on practical but scientific sound and socially acceptable activities. The project manager facilitated the workshop applying skills previously acquired <sup>7</sup>. He was assisted by members of the MRC who were trained in the ZOPP methodology <sup>8</sup>.

#### 3.7.1 Participants

The NPHCC was asked to identify suitable candidates to participate in the workshop. The MRC did not interfere with the selection process, thereby ensuring that the selection process was done within the local culture. The participants included a traditional healer, the village headman, members of a local women's organisation and other NGOs, and mothers.

#### 3.7.2 ZOPP Methodology

The ZOPP methodology consists of two main components, namely (i) an analysis phase, and (ii) the development of a project-planning-matrix.

*Analysis phase:* The first step is the identification of a core problem. Thereafter, cause-effect relationships of underlying problems related to the core problem are identified. A cause-effect relationship can be identified as an "if .....then ....." relationship. An objective tree is constructed by identifying and formulating possible solutions to the core problem. The

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<sup>7</sup> He had attended a course on management of nutrition programmes at the SEAMEO-TROPMED Community Nutrition Training Center in Jakarta, Indonesia, as well as a ZOPP workshop at Stellenbosch presented by Drs R Gross and W Schultink of GTZ

<sup>8</sup> They had attended a ZOPP workshop at Stellenbosch presented by Drs R Gross and W Schultink of GTZ.

objective tree is discussed and its feasibility is considered. If necessary, an alternative tree is constructed.

*Development of the project matrix:* The overall goal, project purpose, results and main activities, and their indicators and means of verification are identified. External influences that are not under the control of the project are expressed as assumptions. Assumptions have to be monitored in order to adapt the design of the project if necessary (Gross, 1993).

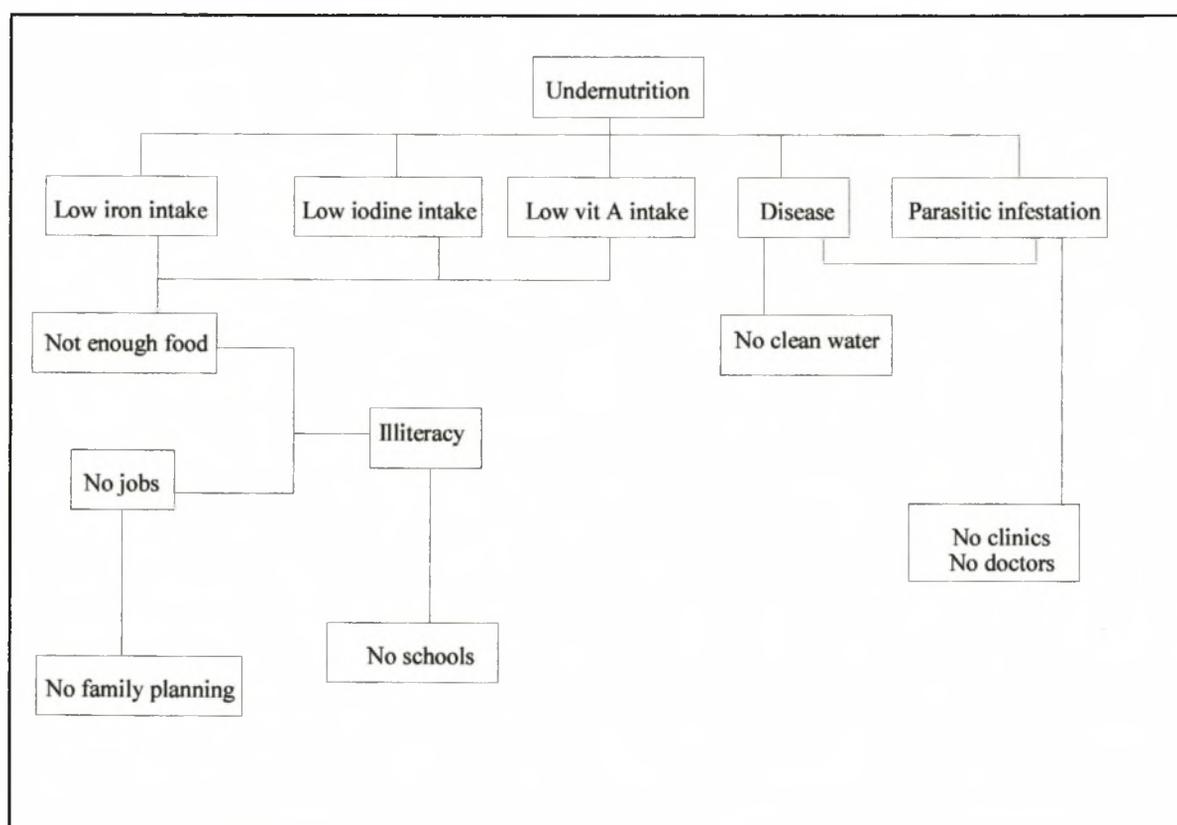
### 3.7.3 Application of the ZOPP methodology

The ZOPP procedure was simplified to meet the needs of this specific community. During the first two days of the workshop, the principles of the ZOPP procedure were explained to the participants. They participated in exercises to familiarise themselves with the procedure. The results from the situation assessment, as summarised in **TABLE 3.9** and section 3.6.3, were then presented to them.

#### (i) Analysis phase

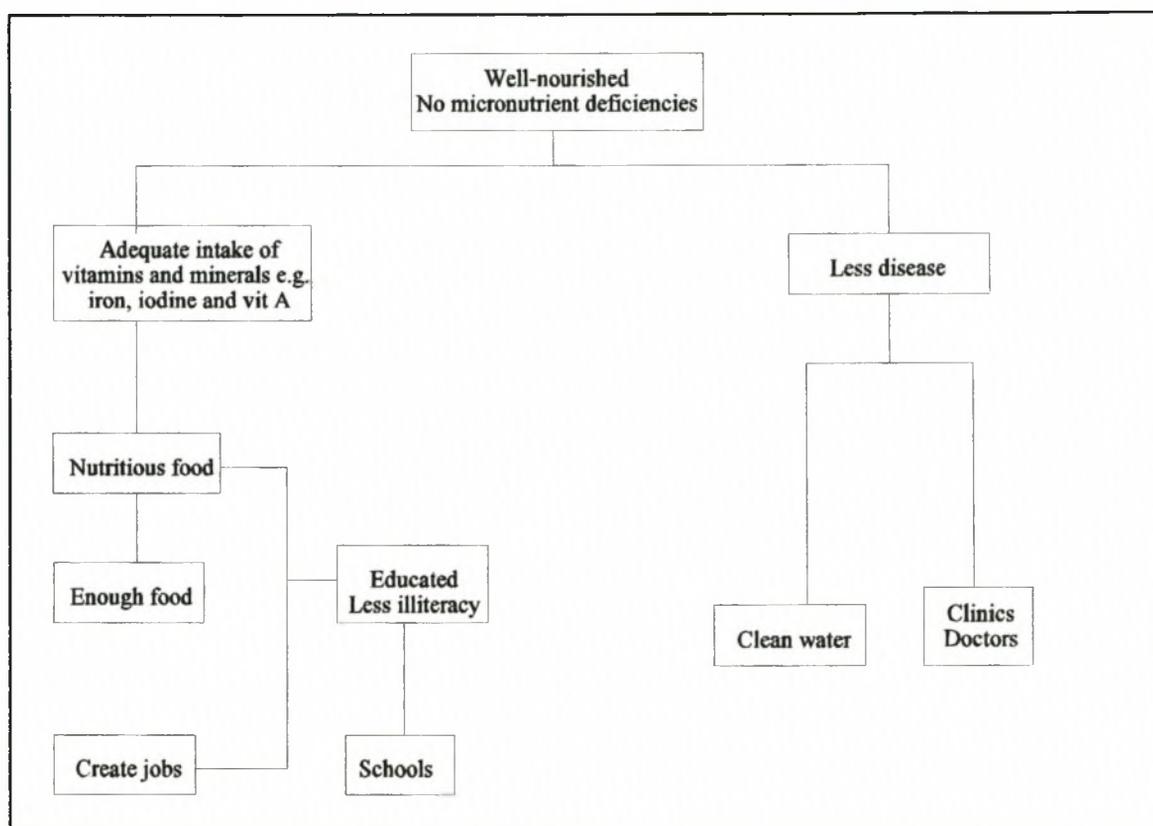
- ▶ The participants were asked to identify the main problems experienced in the community. Health, nutrition, education, socio-economic conditions, transport and income were listed. Nutrition was highlighted as one of the major concerns, and, as this was a topic that fell within the field of expertise of the MRC project team, the workshop focussed on nutrition-related problems.
- ▶ The participants were asked to identify a core problem related to nutrition, which they identified as undernutrition or a lack of nutrients. The facilitator wrote the core problem on a card and stuck it on the wall.
- ▶ The facilitator assisted the participants to identify **causes** of undernutrition, using the findings of the situation assessment. The situation assessment showed that micronutrient deficiencies were prevalent, especially iron, vitamin A (Oelofse *et al.*, 1999) and iodine (Benadé *et al.*, 1997). The participants were asked why these deficiencies were present. They gave low dietary intakes of these nutrients as a reason. The situation assessment also showed that parasitic infections were prevalent (Evans *et al.*, 1997). The participants realised that this could affect the nutritional status of the child, and worms were listed as a cause of undernutrition. Diseases were also identified as a cause of undernutrition.

- ▶ The next step was to identify the causes of these low nutrient intakes, the worms and diseases, respectively. The participants wrote possible causes on cards (one cause per card). Participants who could not write, were assisted by the facilitator.
- ▶ The cards were collected by the facilitator, read aloud, revised if the wording was too long or unclear, and stuck to the wall. The English translation was added to the card by the facilitator. Redundant cards were eliminated.
- ▶ The cards that were stuck on the wall were grouped according to their cause-effect relationship. Relationships were identified by locations on the wall and the cards were connected with lines to construct a causal model consisting of a problem tree pointing out existing problems, as shown in **FIGURE 3.5**.
- ▶ The cards were numbered, and one of the MRC researchers drew the outline of the problem tree on a piece of paper.



**FIGURE 3.5:** The problem tree for undernutrition.

- ▶ The objective tree was constructed in a similar way. Potential solutions based on the problem statements were formulated through positive statements. Again the participants wrote their ideas on cards which were stuck to the wall so that finally an objective tree (FIGURE 3.6) was constructed.



**FIGURE 3.6:** The objective tree for obtaining a better nutritional status.

- ▶ There are many factors that play a role in both the problem tree and objective tree which were not discussed in detail.
- ▶ The *development of the project matrix* was not done with the community representatives.

## (ii) Plan of action

The objective was to have well-nourished children. During the discussions, it became clear that the health of preschool children was of concern, and that the relationship between health and growth of children was well understood. They realised that by monitoring children regularly, malnutrition can be detected at an early stage. During the workshop a need for regular weighing of children, "to see whether the children were healthy", and nutrition related

activities, such as nutrition education, was expressed. They also realised that the clinic situation and lack of health facilities in the area would not be resolved in the near future. It was therefore decided to create an opportunity allowing them to have their children growth monitored within the community. This resulted in the establishment of community-based GM activities for preschool children (Faber *et al.*, 1998), which could act as platform for future community-based nutrition actions. It was agreed that the operational phase of the proposed activities would be the responsibility of the community while the development, monitoring and evaluation of the activities would be carried out by the MRC in collaboration with the community and relevant partners.

Another objective was an adequate intake of vitamins and minerals (**FIGURE 3.6**). This led to the second outcome of the workshop, namely the development of a fortified biscuit to address micronutrient deficiencies in schoolchildren (Van Stuijvenberg *et al.*, 1999), which included deworming of schoolchildren (Evans *et al.*, 1997). The objectives of enough food, nutritious food, an adequate intake of vitamin A and eventually no vitamin A deficiencies were all encompassed in the third outcome of the workshop, namely, the implementation of a household food production project (Faber *et al.*, 2001b) which, in 1999, was integrated with the community-based GM activities.

# **Chapter 4**

## **COMMUNITY-BASED GROWTH MONITORING ACTIVITIES**

## CHAPTER 4

### COMMUNITY-BASED GROWTH MONITORING ACTIVITIES

Although the Ndunakazi and Mkizwana villages were both included in the situation assessment, it was decided to focus on the Ndunakazi village only, with the prospect of extending to the neighbouring village once the project had been established in Ndunakazi. The Ndunakazi village is estimated to be 11 km long and one km wide. A household count in 1998 estimated the population at approximately 200 households and 1 550 people. The population density is therefore estimated to be 141 people per km<sup>2</sup>.

The results of the situation assessment were used to identify activities of the project (**TABLE 4.1**). The overall purpose of the GM project was twofold, namely, to create an opportunity for the mothers to have their children growth monitored monthly, and, secondly, to create a platform for nutrition activities such as, for example, nutrition education.

The community requested that the GM activities started as soon as possible. To avoid any delay, the GM activities were implemented and the nutrition education lessons were developed as the project progressed.

**TABLE 4.1:** Findings of the situation assessment, the activity needed and the purpose of the activity.

<b>Finding</b>	<b>Activity needed</b>	<b>Purpose of activity</b>
<b>NUTRITIONAL STATUS</b>		
▶ prevalence of stunting doubled during the second year of life	▶ GM from an early age ▶ nutrition education	▶ prevent the doubling in stunting ▶ improved complementary feeding
▶ high prevalence of vitamin A deficiency	▶ integration with household food production project	▶ improved vitamin A status
<b>DISEASES</b>		
▶ one-third of mothers had lost a child before the age of 5 years	▶ GM for early detection of growth faltering	▶ referral to clinic
▶ diarrhoea was the main perceived illness	▶ recording of morbidity data	▶ monitor the health status ▶ facilitate the interpretation of the growth curve
<b>CARE</b>		
<u>Care-giving behaviours</u>		
▶ main reason for stopping breastfeeding was the mother's perception that she did not have enough breast milk	▶ nutrition education	▶ increased duration of breastfeeding
▶ complementary foods were introduced too early	▶ nutrition education	▶ delay in introduction of complementary foods
<b>HEALTH SERVICES &amp; ENVIRONMENT</b>		
<u>Utilisation of health services</u>		
▶ after 2 years of age, < 50% of the children were in possession of a RTH card	▶ community-based GM	▶ create an opportunity for the mothers to have their children growth monitored regularly
▶ mainly for immunisation		
<u>Environmental constraints</u>		
▶ the river was the main source of drinking water	▶ nutrition education	▶ reduce the prevalence of diarrhoea
▶ water was seldom boiled before consumption		
▶ 62% of households did not have access to toilet facilities		

#### 4.1 COMMUNITY-BASED GROWTH MONITORING POINTS (*Isizinda*)

In August 1995, the first GM session, which was attended by 38 children, was held at the local school. The first few growth monitoring sessions were held at the school because it was centrally located, known to everybody in the community and was neutral grounds. The concept of community-based GM was new to the mothers, and the GM sessions at the school were used to sensitise the community. For the long-term, the school was not a viable option as the GM sessions disrupted the school activities. The community was asked to identify a suitable venue. No fixed structures were available and it was a joint decision between the NPHCC, the community and the MRC to host the GM sessions at a household.

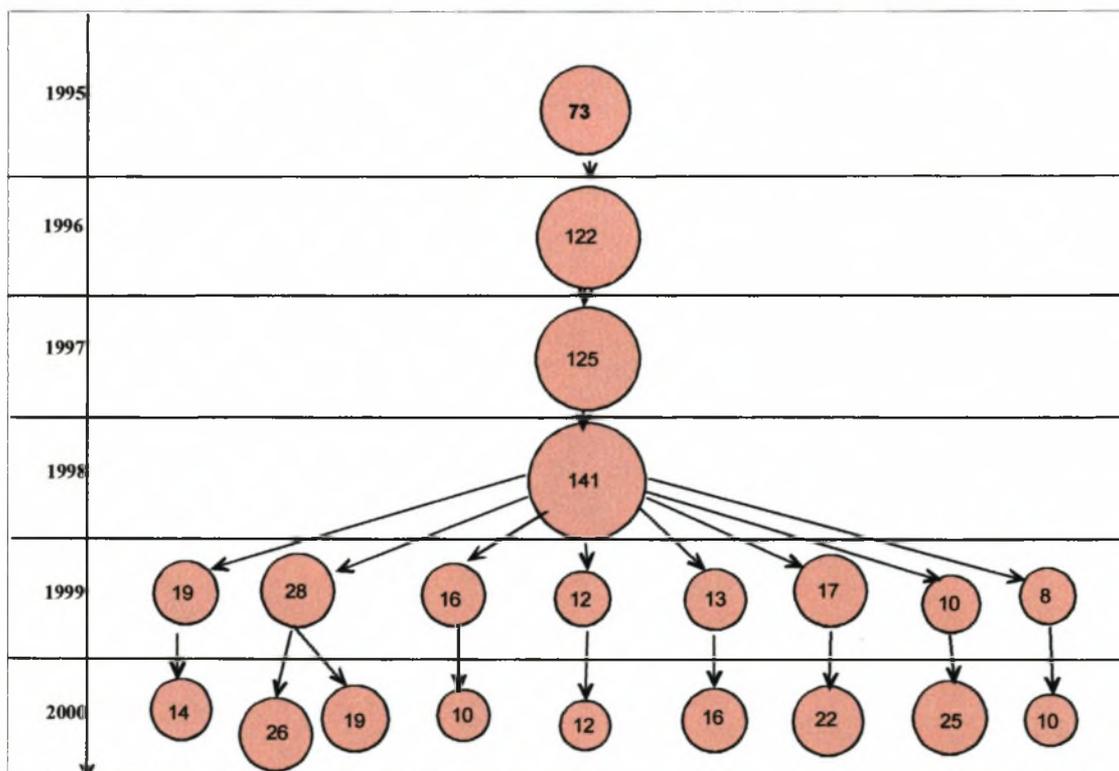
The community assisted the project manager to identify a suitable household to host the GM sessions. Factors taken into consideration were (i) the proximity to the school; (ii) the location within the community (it had to be central); (iii) easy to identify; (iv) accessibility; (v) availability of space; and (vi) commitment of the head of the household. Because the project was new, it was important that the GM sessions were done close to the school, as this enabled the project manager (who was the headmaster of the school) to supervise the activities regularly. The GM point was called *Isizinda*. As the MRC was not sure whether it is was viable to host the *Isizinda* at a household, it was decided to start the project with only one household hosting the *Isizinda*. Three nutrition monitors conducted the GM sessions on three consecutive days each month. The number of children attending was not always spread evenly over the three days, and, at times, the *Isizinda* was overcrowded and the nutrition monitors were overloaded. With only one *Isizinda* in the village, some mothers had to walk very long distances. In 1998, during a community meeting, it was decided to bring the GM sessions closer to the people. It was agreed upon that an *Isizinda* would have a minimum of 8-10 children, in order to make it worthwhile for the nutrition monitors. Taking the size of the dwellings into consideration, the mothers suggested a maximum of 20-25 children per *Isizinda*.

During July 1998, occupants of all accessible households were counted. Escom pole numbers were used to divide the village into geographical sections. The information was used to locate all preschool children per geographical section within the village. This, together with the *Isizinda* register, were used to re-organise the *Isizinda*. The following considerations were taken into account when identifying suitable households: geographical location; accessibility; number of preschool children in the vicinity of the household; the attendance rate of the

preschool child in the household (where applicable); willingness of the mother to participate; and availability of space. During the latter half of 1998, the one *Isizinda* in the village was split into eight smaller *Isizinda*. This was a gradual process and the system was in full operation from January 1999. The *Isizinda* operated according to a fixed time schedule. Two nutrition monitors performed the GM activities, covering the eight *Isizinda* each month.

In 2000, mothers in the catchment area of an existing *Isizinda* requested that a new *Isizinda* be established. It was difficult for them to attend the existing *Isizinda* because of the distance, and also because of a steep uphill that they had to climb. The nutrition monitors held a meeting with the mothers, and they were asked to identify a suitable household, using the same criteria as listed in the previous paragraph. A new *Isizinda* was established to accommodate these mothers.

A schematic overview of the number of *Isizinda* in the Ndunakazi village, and the number of children registered at each *Isizinda*, in December of each calendar year, are given in **FIGURE 4.1**.



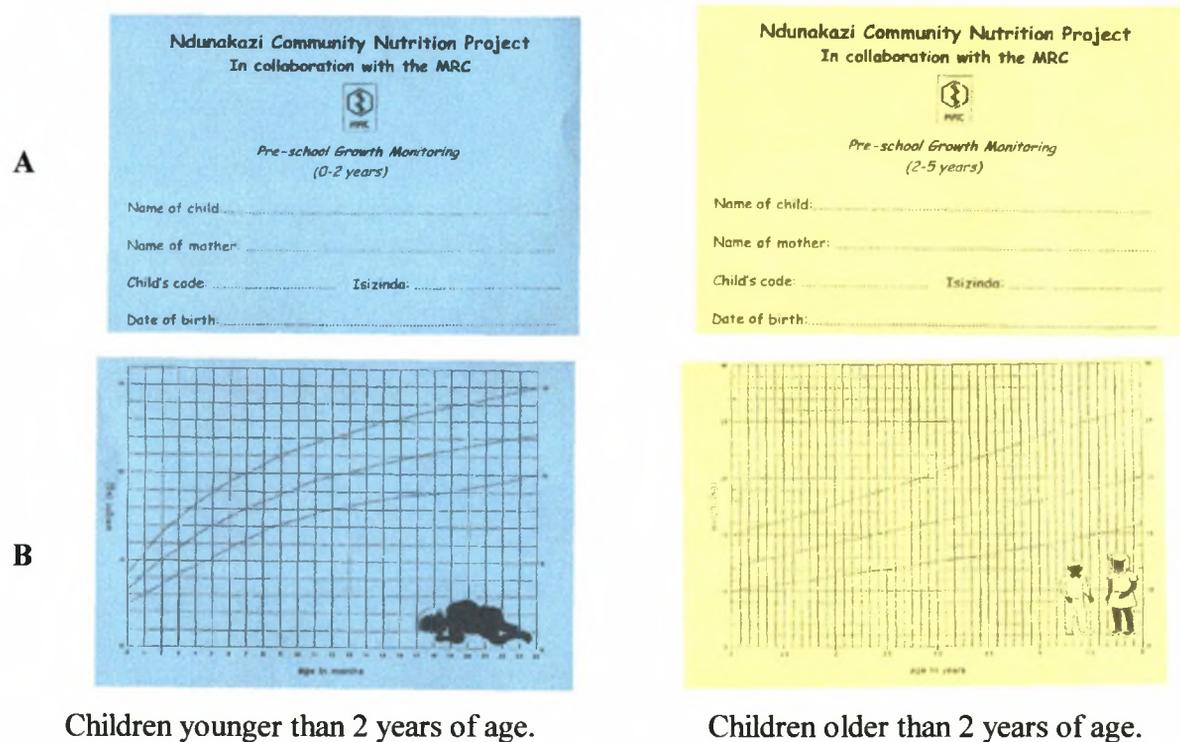
Each *Isizinda* is represented by a circle.

The numbers in the circles are the number of children registered at the specific *Isizinda* in December each year

**FIGURE 4.1:** The number of *Isizinda* and the number of children registered at each *Isizinda* in the Ndunakazi village.

## 4.2 REGISTERING OF CHILDREN

During their first visit, children were registered. Each child was assigned a project code. The child's name, gender, birth order and place of delivery were obtained from the mother. The date of birth and birth weight were obtained from the RTH card. At the time, several different RTH cards were used in KwaZulu-Natal, and it was therefore decided to issue each child with an *Isizinda* card; the details of the child on the one side (FIGURE 4.2A), with a growth chart on the reverse side (FIGURE 4.2B). The latter was based on the revised RTH card that was introduced in the country at the time (*Road to Health booklet*, 1995). At the *Isizinda*, two cards were issued: a blue card for children younger than 2 years, and a yellow card for children older than 2 years. This reminded the nutrition monitors that the length of children under 2 years should be measured in the supine position, while the height of children older than 2 years should be measured in a standing position.



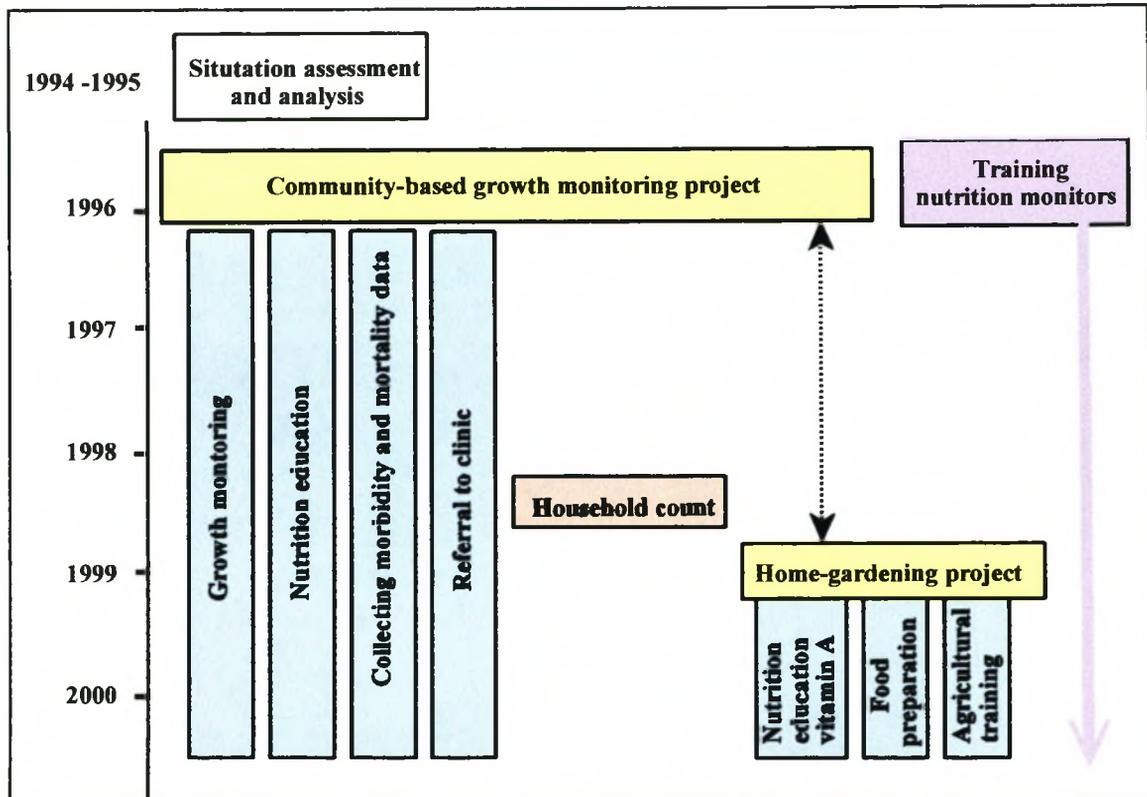
**FIGURE 4.2:** The *Isizinda* cards. The blue card is for children younger than 2 years, and the yellow card for children older than 2 years.

The *Isizinda* cards were kept by the mothers in plastic zipper bags. Mothers were encouraged to keep the *Isizinda* card and the child's RTH card together. Mothers were also issued with a

roster for the GM dates for the year. During the first visit, the importance of GM was explained to new mothers (see section 4.3.2).

### 4.3 ACTIVITIES AT THE *ISIZINDA*

A schematic overview of the activities at the *Isizinda* is given in **FIGURE 4.3**.



**FIGURE 4.3.** A schematic overview of the activities at the *Isizinda*.

#### 4.3.1 Growth monitoring

The core activity at the *Isizinda* was monthly GM of preschool children. Anthropometric measurements included height ( $\geq 2$  years), recumbent length ( $< 2$  years), and weight which was taken without shoes and in light clothing as described by Jelliffe & Jelliffe (1989).

The *length* of children younger than 2 years was measured in a recumbent position on a baby measuring board to the nearest 0.1 cm (**FIGURE 4.4**). Generally, length measurements are difficult to take. Often the child becomes frightened, excited or irritable and has to be

restrained while the length is being measured. The nutrition monitors did their utmost to reassure the mother, and tried to be as calming as possible. The mother assisted with the measurement, holding the baby's head and shoulders. Not only did this have a calming effect on the child, but it also made the mother part of the measuring process. The *height* of children 2 years and older was measured to the nearest 0.1 cm using a wooden board with a fixed tape-measure and a movable headpiece (**FIGURE 4.5**).

The wooden baby measuring boards and height boards, with their fixed measuring tapes, needed no calibration before sessions, making the instruments easy to use and reliable (Vos & Bailey, 1994; Vos, 1995). Length and height measurements were taken three times, and, provided that the range of the three measurements was within 0.5 cm, the middle reading was recorded. It was decided to record the average of the three readings, as this had the potential for incorrect calculations. Although it is recommended that height measurements be done blind (Hall, 2000), the reading, once measured, was compared to the previous reading, and if the reading was found to be lower than the previous one, the measurement (three times) was repeated; if still found to be lower, it was recorded and it was noted that the measurement was double-checked. Monthly height and length measurements can be very close to each other, and at the age of 3 years, it is only possible, at best, to measure height within approximately  $\pm 0.4 - 0.5$  cm, because of the flexibility and changing posture of the child (Vos & Bailey, 1994; Vos, 1995).



**FIGURE 4.4:** Length measurement.



**FIGURE 4.5:** Height measurement.

Weight was measured to the nearest 50 grams on a calibrated electronic load cell digital scale (UC-300 Precision health scale) (FIGURE 4.6A). The accuracy of the scale was checked against an object with a known weight on each day of GM. For infants and small children, the scale was zeroed with the mother standing on the scale, the child was handed to the mother, and the child's weight was measured directly (FIGURE 4.6B).



FIGURE 4.6: Weight measurements.

In the younger child weight is prone to change, depending on whether the weight is taken before or after meals or if the child has passed urine or a stool. To achieve meaningful measurements and avoid unexpected weight loss or weight gain, it has been recommended that babies be weighed without clothing (Davies & Williams, 1983; *INP Strategy, 1999*). At the *Isizinda*, undressing the children was not practical because of a lack of heating facilities (especially on cold winter days). The infants' nappies were removed during a trial period, but once the nappy was removed many of the infants passed urine, and, for hygienic reasons, this was therefore not a viable option. The aim of regular GM is to follow the direction of the growth curve, and weighing the child in light clothing would not have a detrimental effect, assuming that the amount of clothing is more or less similar with each measurement. It is estimated that a child's sweater, hat and shoes weigh only 150 grams (Gerein & Ross, 1991), and it is therefore unlikely that this would make a significant difference to the recorded weight.

The weight of the child was plotted on the child's growth chart. The growth curve was interpreted and the mother was counselled using the guidelines given in TABLE 4.2. The

growth curve was used to discuss the child's growth and progress with the mother. In cases of growth faltering, the child was referred to the nearest clinic and followed up by the nutrition monitors. In cases of normal growth, the mothers were encouraged.

**TABLE 4.2:** Guidelines for interpreting the growth curve and counselling.

<b>Growth curve</b>	<b>Interpretation</b>	<b>Counselling</b>
Growth curve parallel with reference curve	Normal growth	▶ Encourage the mother
Growth curve flattens or decreased for the first time	Early growth faltering	▶ Increase frequency of breast-feeding (where applicable) ▶ Increase portion size ▶ Add some fat, peanut butter, or vegetables to porridge ▶ Feed more regularly
Weight decreased for 3 consecutive months	Growth faltering	▶ Refer to clinic
Growth rises sharply	Gaining too much weight	▶ Ensure formula milk is mixed correctly (where applicable) ▶ Reduce the portion size ▶ Use fat and sugar sparingly

#### 4.3.2 Nutrition and health education

UNICEF's conceptual framework for child malnutrition places great emphasis on care and the importance of women receiving information on breastfeeding and infant feeding (Engle *et al.*, 1997). Nutritional knowledge plays an important role in nutrition education because one assumption underlying nutrition information is that increasing a person's nutritional knowledge brings about desired changes in their food-related attitudes and behaviours (Ladzanie & Brinberg, 1992).

The situation assessment identified a need for nutrition education. Education concerning nutrition and health was given by the nutrition monitors. Sound nutrition was promoted and the education messages were action-orientated, specific, relevant for this community and according to WHO and UNICEF guidelines (*Guidelines for Training Community Health Workers in Nutrition*, 1986; *Joint WHO/UNICEF Nutrition Support Programme*, 1989).

**(i) Identification of topics**

The situation assessment showed that children were previously growth monitored mainly on immunisation dates only. It was therefore important to promote the importance of regular GM to sensitise the community and motivate them to bring their children to the *Isizinda*. The first nutrition education lesson given at the *Isizinda* promoted regular GM (see TABLE 4.4).

Findings of the situation assessment were used to identify three key messages (TABLE 4.3), specifically with regard to breastfeeding, complementary feeding and diarrhoea.

**TABLE 4.3:** Key messages for nutrition education as identified by the situation assessment.

<b>Finding</b>	<b>Message</b>
Main source of drinking water was the Umgeni river Few mothers boiled the water before consumption	▶ Boil the water before consumption
Introduction of solids at an early age	▶ Breast milk alone is sufficient for the first 4-6 months
Insufficient milk was the main reason why mothers stopped breastfeeding	▶ Mothers who breastfeed should: <ul style="list-style-type: none"> <li>- relax</li> <li>- drink a lot of fluids</li> <li>- put the child to the breast often</li> </ul>

The nutrition education lessons were not predesigned, but were developed as the project progressed. The nutrition monitors played an active role in defining the education messages, thereby ensuring that the messages were culturally and socio-economically relevant. The growth curve was incorporated in all education messages, thereby reinforcing the importance of regular GM. For example, when diarrhoea was discussed, the deleterious effects of diarrhoea were explained as a sudden weight loss, as seen on the growth curve. The nutrition lessons overlapped, thereby reinforcing the nutrition messages.

The needs of the mothers dictated new topics to be covered. For example, the mothers requested information on why children become thin, and this was incorporated into the lessons. As the project progressed, nutrition messages were adapted as circumstances changed. For example, when the project started, the water from the river was the main source of drinking water, and a key message was to boil the water before drinking. Currently, many households have access to tap water, and the relevance of this key message has decreased.

## **(ii) Education material**

Initially, when the project started, no teaching aids were used. As the project progressed, simple, but concise, inexpensive education material, that was attractive to both the mothers and the nutrition monitors, was developed. The education material was developed through (i) discussions with the nutrition monitors, (ii) observation, and (iii) feedback from the mothers and nutrition monitors. Involvement of the mothers and nutrition monitors ensured cultural acceptability. Because the nutrition monitors participated in developing the education material, they could identify themselves with it, and it boosted their confidence.

Printed education material consisted of photocopies, laser printer material, and photos taken in the community. Every year, the nutrition education lessons and education materials were changed slightly. The messages were repeated for reinforcement, and the changes were made to keep the mothers interested.

## **(iii) Approach**

Nutrition and health messages were given in group situations as well as to mothers individually, where needed. In the group situation, active participation of the mothers was encouraged, aiming at group discussions rather than a classroom atmosphere. The approach used during the education lesson stressed the importance of learning from the experience of others. For example, if a child was exclusively breastfed for 4-6 months, this mother was used as an example for the other mothers. The topics of the nutrition education lessons, and the education material and approaches used are given in **TABLE 4.4**.

## **(iv) Education when a mother attended for the first time**

The first education lesson given was aimed at increasing the awareness of the benefits of regular GM. During this session the growth chart was explained. Reasons for growth faltering were discussed. Active involvement of the mothers was encouraged. For the last two years, if a mother attended for the first time, a volunteer from the mothers who had been coming for quite some time would, under the supervision of the nutrition monitor and the other mothers present, explain the growth chart to the newcomer. This practice was well accepted. Mothers were also asked to interpret four different growth curves. If the mother comprehended the growth curve, she was applauded by all present. This activity was enjoyed by all. The different measurements taken at the *Isizinda* were explained to the new mother, and demonstrated.

**TABLE 4.4:** The key messages of the nutrition education lessons given at the *Isizinda*, and the education material and approach used.

Topics	Key messages and issues addressed	Education material	Approach
<b>Growth monitoring</b> (Given when a mother attended for the first time)	A well growing child is a healthy child		
	Importance of regular growth monitoring Reasons for growth faltering	Enlarged growth chart	A volunteer from the mothers attending explained the growth chart to the group of mothers
	Interpretation of the growth chart	Four enlarged growth charts, indicating four different growth curves	Individual mothers were asked to identify the different growth curves
	Explanation of measurements taken at <i>Isizinda</i>	Scale; baby measuring board; height board	Demonstration
<b>Breastfeeding</b>	Breast milk alone up to 4-6 months Breast milk protects the baby from disease To ensure enough breast milk, the mother must drink plenty fluids, relax, and put the child to the breast regularly	Poster of breastfeeding mother	The poster is used to start a discussion on breastfeeding
<b>Weaning</b>	<u>0-6 months</u> : Breast milk alone is sufficient <u>6 months</u> : Introducing solid foods, but continue breastfeeding	None	A group discussion on current practices - mothers learned from each other
<b>Making and storage of safe weaning food</b>	Protect foods from insects, rats, germs, poison Let baby eat the food immediately as it cools Keep containers and surroundings clean Wash hands repeatedly Use clean water	None	Group discussions

*continued on next page*

**TABLE 4.4 (continued):** The key messages of the nutrition education lessons given at the *Isizinda*, and the education material and approach used.

<b>Topics</b>	<b>Key messages and issues addressed</b>	<b>Education material</b>	<b>Approach</b>
<b>Reasons for children being too thin</b>	Factors during pregnancy Factors during breastfeeding Factors during weaning Not enough food Not the right food Factors concerning illness Guidelines for feeding the very thin child	Growth chart	A growth chart showing growth faltering was used to start the discussion
<b>Diarrhoea</b>	Causes of diarrhoea Consequences of diarrhoea Preventing diarrhoea Feeding the child with diarrhoea	Demonstration of ORT	Group discussion
<b>Vitamin A*</b>	Magnitude of the problem Consequences of vitamin A deficiency Food sources of vitamin A Preparation methods Importance of home-gardens Importance of daily consumption	Flip file containing pictures	Group discussion with mothers; followed by a lesson with children 2 years and older

\* Related to the household food production project (section 4.3.5)

### 4.3.3 Collection of morbidity and mortality data

Appropriate morbidity and mortality data were continuously collected (**Appendix D**). The value of this information was multifaceted as it gave the nutrition monitors valuable information on each child. Often the reason for a child's undesirable growth pattern can be found in the morbidity data. For example, an episode of diarrhoea could explain a sudden weight loss. The morbidity data helped the monitors to identify children with health problems and it was useful in targeting information given to the individual mother. The guide on how the morbidity data assisted the nutrition monitors to counsel the mothers is given in **TABLE 4.5**.

**TABLE 4.5:** Guidelines for the use of morbidity data to counsel the mothers.

<b>Illness</b>	<b>Counselling advice</b>
<b>Diarrhoea - present</b>	ORT treatment Continue to breastfeed (if applicable) Increase fluid intake
<b>Diarrhoea - previous episode together with weight loss</b>	Increase food intake
<b>Diarrhoea - persistent</b>	Refer to clinic
<b>Loss of appetite</b>	Small, regular feedings
<b>Sores on the body</b>	Keep body clean
<b>Sores on body - infected</b>	Refer to clinic; if the child already attended the clinic, ensure that prescribed treatment is followed
<b>Worms</b>	Refer to clinic for deworming

### 4.3.4 Referral system to the clinic

The care-givers were supported in seeking appropriate and timely health care for their children. Children needing medical treatment were referred to the clinic and followed-up by the nutrition monitors. The child was given a referral letter to take to the clinic. The clinic staff would reply by writing the recommended treatment on the letter, which the mother returned to the nutrition monitor. The role of the nutrition monitor was then to monitor the child to ensure that the treatment was given as prescribed.

#### **4.3.5 Integration with a household food production project**

During the situation assessment in 1994, vitamin A deficiency was prevalent in 45% of preschool children. During the project planning workshop (section 3.7), enough food, especially nutritious food, and ultimately an adequate intake of vitamin A were listed as objectives towards eliminating malnutrition in the area. The community was sensitised towards the elimination of micronutrient deficiencies through the positive results obtained by feeding schoolchildren a fortified biscuit (Van Stuijvenberg *et al.*, 1999). This biscuit was not freely available in the area, and the community expressed a need for a more long-term solution that would benefit the entire community. As animal products are expensive and vegetables rich in  $\beta$ -carotene were not freely available in the village, it was decided at a community meeting to establish a local food production project, focussing on yellow fruits and vegetables and dark-green leafy vegetables.

The Agricultural Research Council (ARC) was invited to assist in establishing the household food production project (Faber *et al.*, 2001b). This project entailed the production of specific crops which were culturally acceptable, underutilised, and which were primary sources of  $\beta$ -carotene and could therefore play a key role in addressing vitamin A deficiency in this community in the long-term. The *Isizinda* provided a captive audience, and the household food production activities were integrated with the community-based GM activities. Since 1999, the *Isizinda* served as training centres and provided the infrastructure that was needed for the promotion of the agricultural activities.

##### **(i) Training of nutrition monitors for the agricultural activities**

Four nutrition monitors and the project manager attended a 5-day training workshop presented by the ARC. The training course addressed theoretical and practical aspects regarding vegetable production. Aspects such as soil preparation, fertilisation, top-dressing, planting and sowing, plant spacing, irrigation, crop rotation, cultivar choice, weeding, maintenance, pest and disease management, and harvesting were included in the initial training. Further on-the-job training was provided as a continuous process and the nutrition monitors were assisted by an adviser of the ARC who visited the area from time to time during critical production phases in the vegetable production season during the first year.

### **(ii) Agricultural activities at the *Isizinda***

As part of the food production project, a demonstration garden (10 m x 10 m) was established at each *Isizinda* (FIGURE 4.7). Crops that were planted in the demonstration gardens were butternut, carrots, an orange-fleshed sweet potato, and spinach. Each garden also had a paw-paw tree. The demonstration gardens served as training centres. On the day of GM, agricultural activities were promoted and demonstrated to all mothers who attended the *Isizinda*. They were given the opportunity to practice what they had learned under the supervision of a nutrition monitor. The mothers were encouraged to plant  $\beta$ -carotene-rich vegetables at household level in addition to any existing crops. Staggered planting, cyclic production and crop rotation were promoted to ensure an adequate supply of  $\beta$ -carotene-rich foods throughout the year. Skills acquired by the mothers were applied in their home-gardens.



**FIGURE 4.7:** A demonstration garden next to an *Isizinda*.

### **(iii) Promotion of the agricultural activities at the *Isizinda***

#### ***Education lesson***

At the *Isizinda*, the production of yellow fruits and vegetables and dark-green leafy vegetables at household level was promoted, and daily consumption of these food items was strongly recommended. The nutrition education component focussed on messages regarding the relationship between vitamin A and health, the identification of vitamin A-rich foods, food preparation methods, and the importance of a home-garden as a source of vitamin A-rich foods. Education material was developed as described in section 4.3.2.

### ***Food preparation***

Depending on the season, locally produced vegetables were prepared and fed to all children attending the *Isizinda*. On the day of GM, vegetables from the demonstration gardens were harvested and prepared by a nutrition monitor. As the project progressed, the role of the mothers became bigger, and at the end of 2000, the vegetables were prepared mostly by volunteers. The children and their mothers were introduced to these vegetables when attending the monthly GM sessions. The purpose of the cooked vegetables at the *Isizinda* was not to feed the children. As most of the mothers were not familiar with these vegetables, the cooked vegetables on GM days were used to (i) introduce the mothers and children to these vegetables, (ii) teach the mothers various ways of preparation, and (iii) give the mothers the opportunity to observe their children eat (and enjoy) it. The latter served as motivation for the mothers to plant these vegetables at household level and to prepare it at home. Grating of carrots and the addition of a little bit of fat was strongly recommended. The mothers were taught to mash the vegetables for the smaller child.

A schematic overview of the various activities at the *Isizinda* of the integrated project is shown in **FIGURE 4.8** on pages 110 and 111.

## **4.4 MANAGEMENT OF THE *ISIZINDA***

### **4.4.1 *Isizinda* register**

Each *Isizinda* had a file containing an attendance register and the monitoring forms (**Appendix D**) for all registered children. The attendance register and monitoring forms were for a calendar year and were replaced during December of the preceding year. After each GM session, the nutrition monitor summarised the attendance ratio on a special form.

### **4.4.2 Rosters**

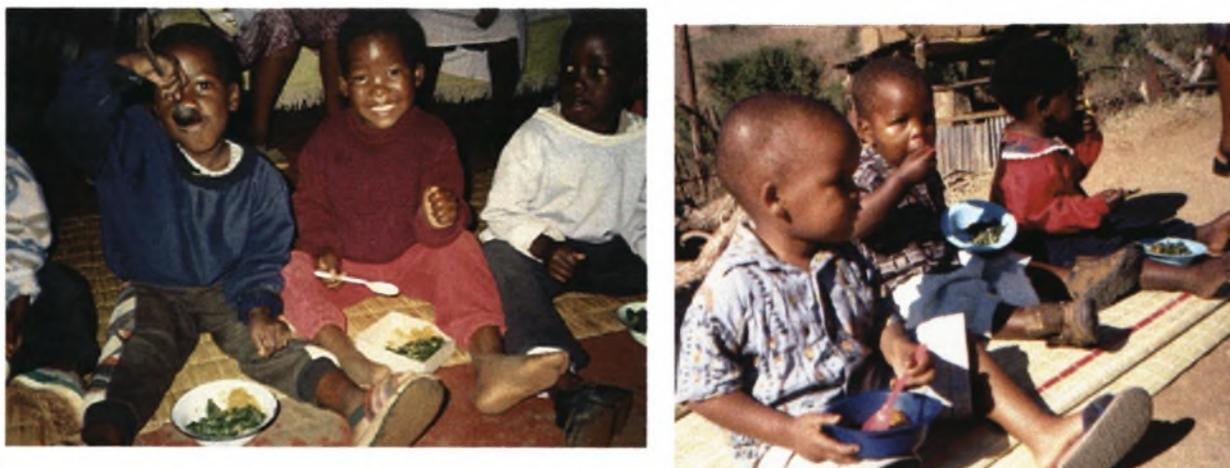
The roster for the GM sessions was compiled for each calendar year. This indicated the dates of the GM sessions, as well as the education lesson that should be given. The roster was designed in such a way that the pattern stayed the same as far as possible. For example, the

**FIGURE 4.8:** Activities at *Isizinda* of the integrated project

**Step 1.** Vegetables from the demonstration-garden are harvested, washed, and prepared.



**Step 2.** Children attending the growth monitoring session enjoy cooked  $\beta$ -carotene-rich vegetables from the demonstration-garden



**Step 3.** Nutrition education.



*Education is done mainly in a group situation.*



*Children participate in the education.*

**Step 4.** Agricultural activities are demonstrated in the demonstration-garden, and the mothers have the opportunity to practice to plant under the supervision of a nutrition monitor.



*A nutrition monitor demonstrates the planting process.*



*Mothers planting under the supervision of a nutrition monitor.*

**Step 5.** Anthropometric measurements of the preschool children are taken. Morbidity data is collected. The growth of the child is discussed with the mothers using the growth chart.



*Height is measured.*



*Weight is measured.*



*Morbidity data is collected. The child's growth is discussed with the mother using the growth chart.*

GM session at Mrs Duma's house was always on the first Monday of each calendar month. During December, each mother received a roster for the next calendar year. A roster was also put up at each household hosting the *Isizinda*. New mothers received a roster during their first visit. In addition to the rosters, the nutrition monitors reminded the mothers of the next GM date before they left the *Isizinda*.

#### **4.4.3 Equipment**

Each *Isizinda* was provided with an electronic scale, a baby measuring board and a height board. All the equipment, such as the *Isizinda* file, blank growth charts, stationery, scale, etc, was locked away in a trunk that was kept at each household hosting an *Isizinda*. The measuring boards were too big for the trunk and the mothers of the household who hosted the *Isizinda* took responsibility for them.

#### **4.4.4 Responsibilities of the mothers hosting the *Isizinda***

The mothers of the household hosting the *Isizinda* took responsibility for all the equipment such as the trunk, measuring boards and, for the garden project, garden tools. They took responsibility for reminding the mothers in the area of the next GM date. After integration with the food production project, they took responsibility for weeding and watering the demonstration garden. As incentive, they had access to vegetables from the demonstration garden for household use, but they were not allowed to sell any of the produce. They distributed some of the produce to other households, who in turn, helped with the weeding and watering of the demonstration garden.

#### **4.4.5 Role of the project manager**

The various aspects of the project were managed and co-ordinated by the project manager. A staff meeting was scheduled for every month. During these meetings, the nutrition monitors gave feedback on the progress of the project and problems were discussed. Minutes of the meetings were given to the project leader with whom the project manager met monthly to discuss the progress (and problems) of the project. When needed, a community meeting was

arranged for further discussions and problem-solving. The role of the project manager was invaluable, and his strong, dedicated and enthusiastic leadership strengthened the community's acceptance of the project.

As the project progressed, an increasing amount of responsibility was delegated to the nutrition monitors. Authority was delegated to one of them to act as supervisor, under the guidance of the project manager. He took responsibility for administrative activities and facilitated monthly staff meetings during which the nutrition monitors rotated in taking minutes.

#### **4.5 TRAINING OF THE NUTRITION MONITORS**

The initial training of the nutrition monitors for the GM activities was done over a period of five days and equipped them with the skills to complete the register, take the anthropometric measurements and promote the importance of regular GM. Further in-service training, one day per month for 12 months, covered the following topics: growth of children, malnutrition, breastfeeding, complementary feeding, management of diarrhoea, safe food, and hygiene. The training was task orientated and the nutrition monitors were provided with the necessary knowledge and skills needed to perform each task. Each skill was backed up by theoretical knowledge, presented in simple terms. Theoretical aspects were covered through homework-reading, followed by group discussions. WHO guidelines for training of health workers (*Guidelines for training community health workers*, 1986) were used.

Continual in-service training and supportive supervision were ongoing processes which were dictated by the needs of the nutrition monitors. These were competency-based, and focussed on the operational aspects of the project, the perceived problems of the nutrition monitors and problems observed by the project leader. This ensured that the nutrition monitors had adequate skills to perform their duties and that new concepts were incorporated in the daily activities.

The training included the concept that, when growth faltering occurs, the advice given must reflect local conditions, taking into account events happening in the community and the circumstances of the specific household (Nabaro & Chinnock, 1988).

In 1999, a 2-day training session on vitamin A nutrition was held to cover the promotional component of the food production programme. During December of each year, a

2-3 day refresher training course was held focussing on problem areas identified by the nutrition monitors and observed by the project leader.

Principles applied during the training were as follows: The training was given in the village under the same conditions under which the project operated. The training was concise and directed at the nutrition-related problems within the village. Each training session started with an overview of the content and the purpose of the training, and ended with a review of the day's activities. Only one topic was addressed per session. The training focussed on job orientation, problem-solving, technical ability and accuracy. Participatory techniques were encouraged and role-play formed an integral part of the training sessions. Other teaching methods included lectures, discussions, and practical sessions. Technical aspects such as weighing and plotting the weight were continuously practised. The training programme was not rigid and allowed flexibility to address specific needs as they arose. The tasks required for each activity, the skills needed, and the training provided are summarised in **TABLE 4.6**.

**TABLE 4.6:** Tasks required for the *Isizinda* project, the skills needed to perform the tasks, and the training method used to provide the nutrition monitors with these skills.

<b>Task required</b>	<b>Skills needed</b>	<b>Training method</b>
<b>Anthropometric measurements</b>	Calibration of scales	Practical
Weight	Weighing of infants and children	
Length	Length measurements of children < 2 years	
Height	Height measurements of children ≥ 2 years	
<b>Plotting of the growth curve</b>	Determining the age of the child	Theoretical Practical
	Plotting the weight	
	Interpreting the growth curve	
	Explaining the growth curve	
<b>Nutrition education</b>	Communication	Theoretical Role play Practical
<b>Morbidity data</b>	Interviewing the mother	Practical
	Completing questionnaires	
<b>Recruitment</b>	Communication	Role-play Discussions

#### 4.6 CHARACTERISTICS OF THE NUTRITION MONITORS

Since 1995, nine nutrition monitors, of whom one resigned, were involved in various activities of the *Isizinda* project. At the time when they joined the project, they were mostly in their late twenties or early thirties. They had either Std 9 or Std 10. They were Zulu-speaking, and fluent in English. Three were from the Ndunakazi village. Two of the four men and one of the five women were married. Only one of the five women did not have children. Although a total of nine nutrition monitors were trained to perform the GM activities, only two were allocated exclusively to the GM activities. The responsibilities of the eight nutrition monitors at the nine *Isizinda* (I:1-I:9) at the end of 2000 are summarised in TABLE 4.7.

**TABLE 4.7:** Responsibilities of the eight nutrition monitors who were employed by the MRC during 2000.

	NM1	NM2	NM3	NM4	NM5	NM6	NM7	NM8
Heights and weights (all <i>Isizinda</i> )	■							
Plotting weight (all <i>Isizinda</i> )		■						
Counselling mothers (all <i>Isizinda</i> )		■						
Recording of morbidity data		■						
Referral to clinic		■						
Nutrition education (all <i>Isizinda</i> )	■							
Cooking vegetables ( <i>Isizinda</i> 1-4)			■					
Cooking vegetables ( <i>Isizinda</i> 5-9)				■				
Agricultural training ( <i>Isizinda</i> 1-3)					■			
Agricultural training ( <i>Isizinda</i> 4-6)						■		
Agricultural training ( <i>Isizinda</i> 7-9)							■	
Follow-up of children ( <i>Isizinda</i> 1-4)	■							
Follow-up of children ( <i>Isizinda</i> 1-9)		■						
Follow-up home-gardens ( <i>Isizinda</i> 1-4)					■			
Follow-up home-gardens ( <i>Isizinda</i> 4-9)						■		
Follow-up home-gardens ( <i>Isizinda</i> 7-9)							■	
Other activities								■

NM: nutrition monitor (1 to 8)

**TABLE 4.7** does not give a true reflection of the number of nutrition monitors needed to run the project. The *Isizinda* activities were not the only responsibilities of the nutrition monitors. In 2000, they were involved in GM activities at five *Isizinda* in the neighbouring village (at the request of the people), and they assisted with a multicentre study in another area. The nutrition monitors were also involved in various surveys in Ndunakazi, which entailed the completion of questionnaires. Between 1995 and 1999, at times, four of the nutrition monitors were involved in school-feeding studies, and two were involved in a study on the elderly. It is envisaged that, once all research activities are completed, the *Isizinda* project will eventually be run by only one nutrition monitor, who will be assisted by community volunteers. The scaling down of the number of nutrition monitors will be a gradual process. During 2002-2003, the project will be run by three nutrition monitors, during which period they will recruit and train volunteers. Thereafter, only one nutrition monitor will be involved.

## **4.7 MONITORING THE ACTIVITIES**

### **4.7.1 Monthly visits by the project leader**

The project leader met with the nutrition monitors monthly to discuss the progress of the project and problems they encountered in carrying out their tasks, and to review the information collected. This allowed for the assessment of the performance of the nutrition monitors and the quality of the service provided. These monthly visits were also used for in-service training, and allowed the opportunity to make improvements and to keep the morale of the nutrition monitors high, assuring them that of their performance and of their valuable role in the project and the community.

#### **(i) Attendance register**

The summaries of the attendance at each *Isizinda* for the previous month was reviewed. Special attention was given to those *Isizinda* that showed a lower than normal attendance. The most common reasons for low attendance were that the GM session was on the same day that either pensions were payed or the mobile clinic visited the area, it rained heavily, or there was a funeral in the area. The nutrition monitors were advised to reschedule such GM sessions for another day.

**(ii) *Isizinda* files**

The project leader scrutinised the *Isizinda* files for completeness and accuracy, focussing on missing data, unrealistic weight and height/length values and decreasing height/length values. Problems identified were used to target the in-service training.

**(iii) Observation**

The project leader attended at least one GM session each month. Attention was paid to the following:

- ▶ the condition of the equipment and the accuracy of the scale
- ▶ the accuracy of the weight and height/length measurements
- ▶ the accuracy of plotting the weight
- ▶ interpretation of the growth curve
- ▶ counselling of the mother
- ▶ referral to clinic (where applicable)
- ▶ nutrition education and use of education material
- ▶ general communication between nutrition monitors and mothers and handling of children
- ▶ cooking of vegetables and teaching of agricultural activities (since the integration with the food production project)
- ▶ general operation of the *Isizinda*

**(iv) Staff meetings**

The project leader held group discussions with the nutrition monitors to discuss the progress of the project and any problems encountered.

**4.7.2 Community meetings**

Community meetings were held at least twice a year, or more often when needed. These meetings were facilitated by the project manager. The project leader stayed on the background and only gave input when needed. During these meetings, feedback on the progress of the project was given. The community had the opportunity to raise questions and concerns, which were then discussed. When either problems had to be solved or decisions had to be taken, the issue was discussed and if no consensus was reached, those present voted. The MRC did not interfere when decisions were taken.

Descriptive data collected monthly at the *Isizinda* are described in the next chapter.

# **Chapter 5**

## **DESCRIPTIVE DATA OF THE CHILDREN ATTENDING THE *ISIZINDA***

## CHAPTER 5

DESCRIPTIVE DATA OF THE CHILDREN ATTENDING THE *ISIZINDA*

This chapter describes information on the children who attended the *Isizinda* from 1995 to 2000. GM and morbidity data are presented as descriptive data.

5.1 CHARACTERISTICS OF THE CHILDREN ATTENDING THE *ISIZINDA*

The total number of children who attended the *Isizinda* from 1995 until 2000, their gender, place of birth (hospital/clinic or home), birth weight and birth order were obtained from the *Isizinda* registers. This information is summarised in TABLE 5.1. Of the children, 24% were born at home, and the prevalence of low birth weight was 10%.

**TABLE 5.1:** Characteristics of all the children who attended the *Isizinda* in the Ndunakazi village from 1995 to 2000.

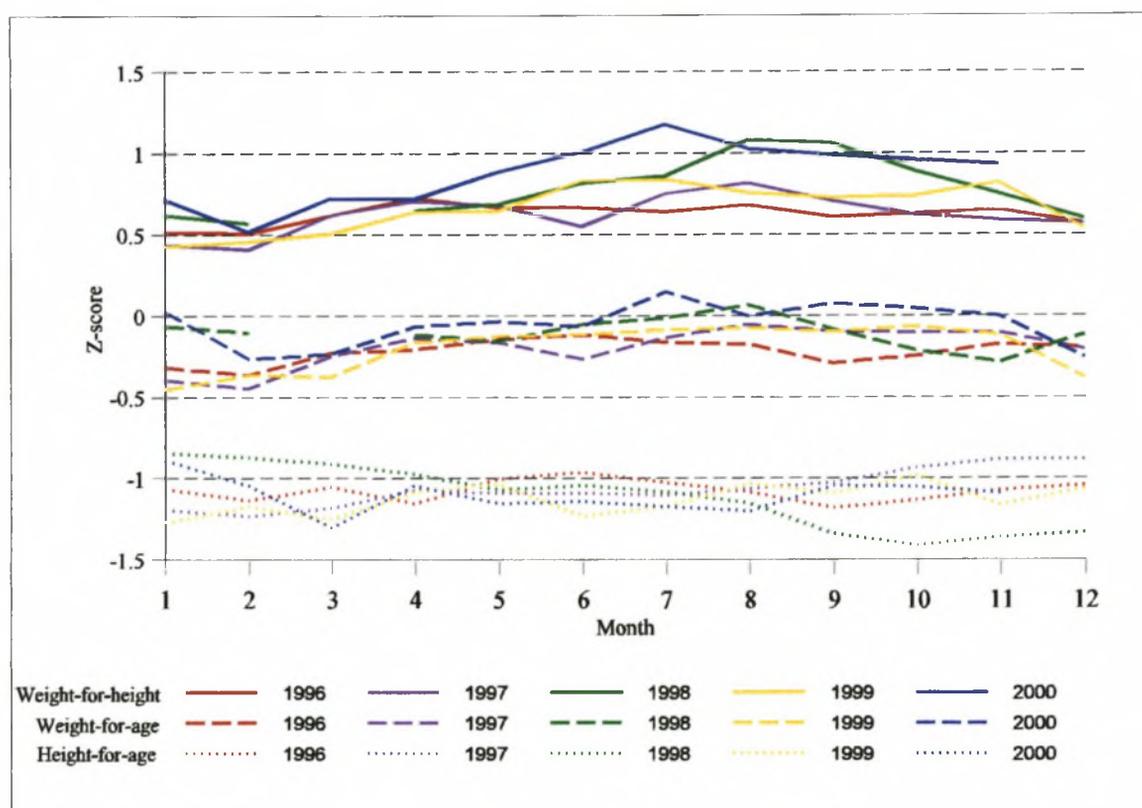
<b>Total number</b>	n=329
<b>Gender</b>	
Boys (%)	47
Girls (%)	53
<b>Home-births (%)</b>	24 <sup>a</sup>
<b>Birth weight &lt; 2 500 g (%)</b>	10
<b>Position of the child (%)</b>	
1	43
2 - 4	46
5 - 7	8
8 - 10	3

<sup>a</sup> Data available for 292 children  
(Place of birth was only recorded since 1997)

## 5.2 ANTHROPOMETRIC STATUS

Anthropometric data that were collected monthly at the *Isizinda* for the period 1996-2000 were analysed with Epi-Info version 6 software program, with the NCHS median as reference

(Hamill *et al.*, 1979), and expressed as Z-scores for each of the anthropometric indices of malnutrition. Children with height-for-age, weight-for-age and weight-for-height Z-scores more than two standard deviations (SD) below this reference median were classified as stunted, underweight and wasted, respectively (Gorstein *et al.*, 1994). For each month, the average Z-scores for the three indices, respectively, were calculated for all the children weighed and are presented for each calendar year in **FIGURE 5.1**. From this figure it seems that there was no seasonal effect on the nutritional status of the children, using anthropometric measurements as indicators.



**FIGURE 5.1:** Mean Z-scores for weight-for-height, weight-for-age, and height-for-age for each month per year.

The mean Z-scores for the three anthropometric indices, respectively, was calculated for all child contacts<sup>9</sup> for each calendar year. In **TABLE 5.2**, the mean and standard deviation for the anthropometric indices, expressed as Z-scores, are given for the total number of child contacts for each year from the beginning (1995) until the end (2000) of the study. The

<sup>9</sup> One child contact equals one visit of a child to the *Isizinda*.

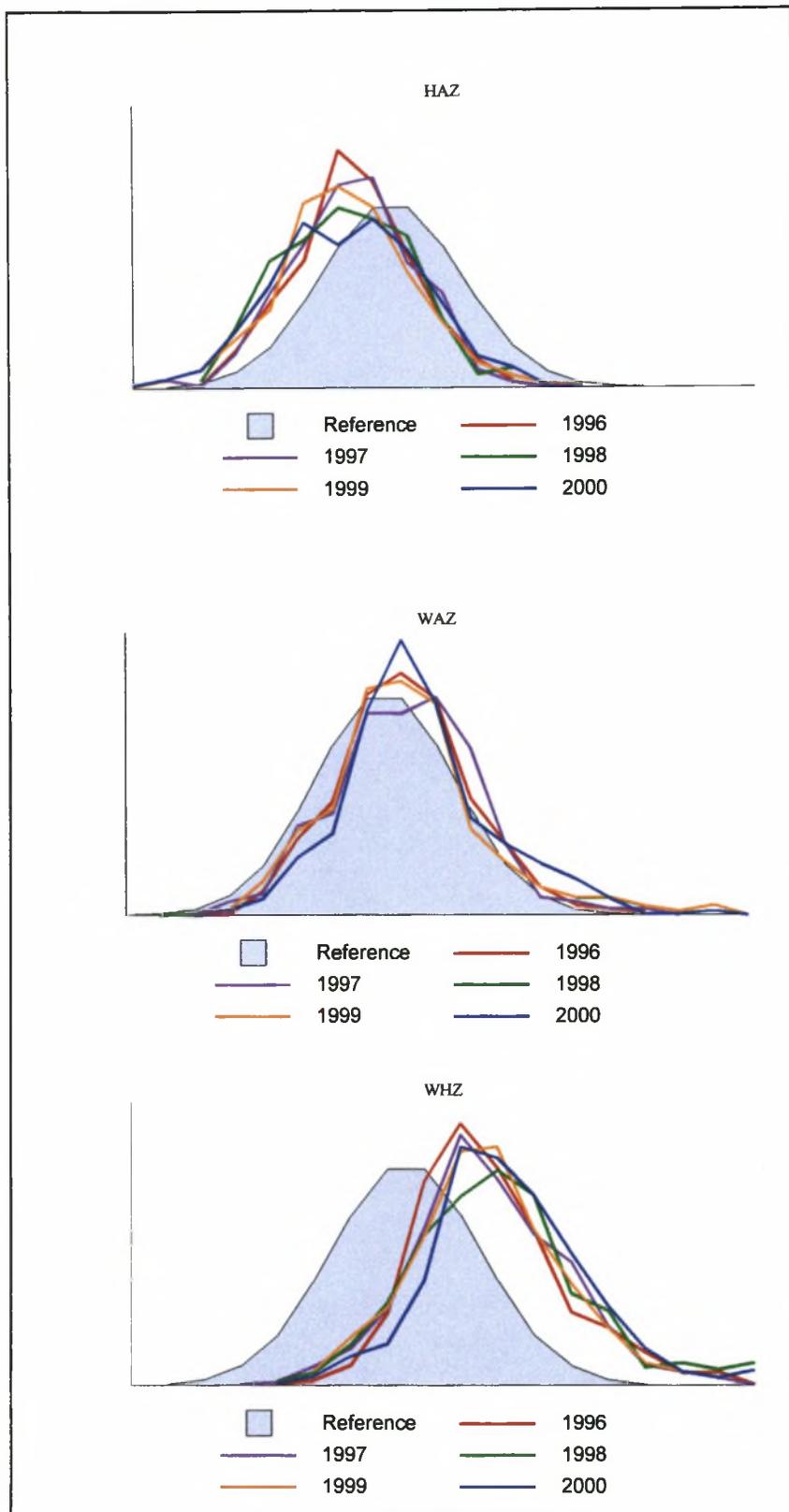
*Isizinda* project was launched during the second half of 1995, a small number were registered, and the children attending the *Isizinda* during the first few months were probably not representative of the population. The distribution curves for the three anthropometric indices as compared to the reference population (Hamill *et al.*, 1979) are given in **FIGURE 5.2**, which shows that the distribution curve for height-for-age was shifted towards the left indicating decreased linear growth. The distribution curve for weight-for-height was shifted towards the right indicating a tendency towards overweight.

**TABLE 5.2:** Means and standard deviations (SD) of age (expressed in months) and selected anthropometric indices (expressed as Z-scores) of all contacted children per calendar year between the beginning (1995) and the end (2000) of the study.

	1995	1996	1997	1998	1999	2000
<b>Child contacts</b>	228	926	889	924	952	1 025
<b>Age (months)</b>	30.5 (19.1)	28.8 (17.3)	31.2 (17.6)	27.8 (17.7)	31.6 (18.8)	33.5 (20.1)
<b>Height-for-age (Z-score)</b>	-0.82 (1.20)	-1.08 (0.88)	-1.06 (0.88)	-1.14 (0.93)	-1.12 (0.95)	-1.10 (1.06)
<b>Weight-for-age (Z-score)</b>	-0.16 (0.97)	-0.21 (0.96)	-0.19 (1.02)	-0.13 (1.18)	-0.18 (1.18)	-0.01 (1.08)
<b>Weight-for-height (Z-score)</b>	0.49 (1.04)	0.63 (1.01)	0.62 (1.04)	0.78 (1.25)	0.67 (1.13)	0.89 (1.09)

The data from 1995 until 2000 were pooled to generate age specific anthropometric information. The anthropometric status of the children at different ages is summarised in **TABLE 5.3** and a schematic overview is given in **FIGURE 5.3**. At three months of age, the prevalence of stunting was 13%, and it increased steadily during the second year of life, whereafter it remained fairly constant. When compared to the reference population (Hamill *et al.*, 1979), the infants started with a high prevalence of overweight. The prevalence of overweight subsequently declined and for children older than 2 years the prevalence of overweight was lower than 5%.

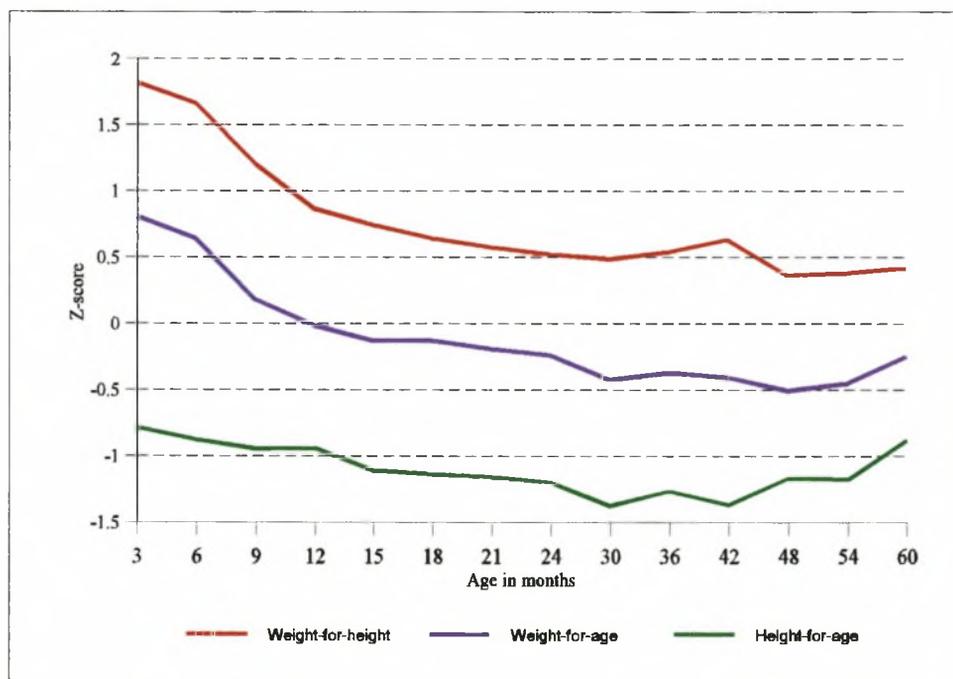
The data collected at the *Isizinda* (**TABLE 5.3**) were very similar to the anthropometric data collected during the situation assessment (**TABLE 3.7**), indicating that the *Isizinda* data are representative of the community.



**FIGURE 5.2:** The distribution curves for height-for-age (HAZ), weight-for-age (WAZ) and weight-for-height (WHZ), expressed as Z-scores, for all child contacts per year against the reference curve.

**TABLE 5.3:** Means and standard deviations (SD) of selected anthropometric indices (expressed as Z-scores) at different ages (in months), for all the children who attended the *Isizinda* from the start (1995) until the end (2000) of the study.

Age	n	Height-for-age		Weight-for-age		Weight-for-height		
		mean (SD)	%<-2SD	mean (SD)	%<-2SD	mean (SD)	%<-2SD	%>2SD
3 m	93	-0.79 (1.16)	13	0.81 (1.16)	1	1.82 (1.27)	1	40
6 m	98	-0.88 (1.03)	12	0.64 (1.22)	1	1.66 (1.22)	-	38
9 m	86	-0.95 (0.92)	10	0.18 (1.11)	1	1.20 (1.67)	-	24
12 m	93	-0.94 (0.93)	9	-0.02 (1.21)	2	0.86 (1.18)	-	16
15 m	80	-1.11 (1.08)	15	-0.13 (1.10)	4	0.74 (0.99)	-	14
18 m	81	-1.14 (0.84)	16	-0.13 (0.84)	1	0.64 (1.14)	1	9
21 m	88	-1.16 (0.93)	15	-0.19 (1.18)	3	0.57 (1.15)	-	7
24 m	81	-1.20 (1.02)	22	-0.24 (1.09)	4	0.52 (1.05)	1	9
30 m	73	-1.38 (0.96)	19	-0.43 (0.96)	3	0.48 (0.89)	-	4
36 m	90	-1.27 (0.87)	22	-0.37 (0.86)	2	0.54 (0.83)	-	4
42 m	86	-1.37 (1.02)	16	-0.41 (0.92)	6	0.63 (1.02)	-	3
48 m	74	-1.17 (0.85)	18	-0.51 (0.84)	3	0.36 (0.87)	-	3
54 m	62	-1.18 (1.02)	24	-0.45 (0.82)	5	0.38 (0.89)	-	3
60 m	46	-0.88 (0.92)	11	-0.25 (0.84)	2	0.42 (0.73)	-	-



**FIGURE 5.3:** The mean Z-scores of selected anthropometric indices at different ages (in months), for all the children who attended the *Isizinda* from the start (1995) until the end (2000) of the study.

### 5.3 MORBIDITY DATA

The *Isizinda* registers were used to calculate the percentage of child contacts positive for (i) an episode of diarrhoea and (ii) an episode of respiratory infections, respectively, for the two weeks prior to the GM session. For all children 5 years and younger, the percentage child contacts that was positive for an episode of diarrhoea for each calendar year from 1996 to 2000 is summarised in **TABLE 5.4**. The percentage of child contacts that were positive for diarrhoea decreased steadily each year from 8.0% in 1995 to 2.2% in 2000.

**TABLE 5.4:** Percentage of child contacts that was positive for an episode of diarrhoea for all children 5 years and younger who attended the *Isizinda*. The data is presented for each calendar year.

	<u>CALENDAR YEAR</u>				
	<b>1996</b> <i>n</i> =926	<b>1997</b> <i>n</i> =889	<b>1998</b> <i>n</i> =924	<b>1999</b> <i>n</i> =952	<b>2000</b> <i>n</i> =1025
<b>Child contacts positive for diarrhoea (%)</b>	8.0	7.1	5.2	4.1	2.2

The data from 1996 to 2000 was pooled. The percentage child contacts that were positive for an episode of diarrhoea per age category, in one year intervals, is summarised in **TABLE 5.5**. The prevalence of diarrhoea was the highest in children aged 1-<2 years. Since 1998, reportedly no child received an enema when presenting with diarrhoea.

**TABLE 5.5:** Percentage of child contacts that was positive for an episode of diarrhoea for all children who attended the *Isizinda* from 1996 until 2000. The data is presented per age category (in one year intervals).

	<u>AGE CATEGORY</u>					
	<b>0-&lt;1</b> <b>year</b> <i>n</i> =995	<b>1-&lt;2</b> <b>years</b> <i>n</i> =928	<b>2-&lt;3</b> <b>years</b> <i>n</i> =879	<b>3-&lt;4</b> <b>years</b> <i>n</i> =901	<b>4-&lt;5</b> <b>years</b> <i>n</i> =746	<b>5-&lt;6</b> <b>years</b> <i>n</i> =267
<b>Child contacts positive for diarrhoea (%)</b>	8.6	11.7	7.6	3.1	2.2	1.1

The percentage child contacts positive for coughing and a runny nose was very low over the five-year period (1.6% and 1.0%, respectively), and is therefore not reported separately for each calendar year.

# Chapter 6

## **ACCEPTABILITY OF THE *ISIZINDA* PROJECT**

## CHAPTER 6

### ACCEPTABILITY OF THE *ISIZINDA* PROJECT

The aim of this phase of the study was to measure the *acceptability* of the *Isizinda* project in terms of

- (i) attendance, with regard to coverage, attendance ratio, age distribution of children attending the GM sessions, and adequacy in terms of the *INP Strategy* (1999); and
- (ii) maternal attitude, with regard to the mothers' opinions on what they have learned, aspects either liked or disliked, the way the project was run, perceived health benefits, and whether they thought that the project was sustainable.

#### 6.1 METHODS

##### 6.1.1 Indicators

An indicator is an objectively verifiable measurement which reflects the activity, assumption, or effect being measured, and allows for comparisons both between different populations and between measures of the same population at different points in time. Good indicators are simple, clearly defined, measurable, variable, valid, reliable and quantifiable (Levinson *et al.*, 1999).

##### *Number of children registered*

Children were registered when they attended a GM session for the first time and they remained registered in the project until they (i) started schooling, (ii) moved out of the area, or (iii) died. For each month, the number of children who were registered in the project, from 1995 until 2000, was obtained from the *Isizinda* registers.

##### *Number of children who attended*

For each month, the number of children who attended the GM sessions was obtained from the attendance registers kept at the *Isizinda*.

### *Attendance ratio*

For each month, the attendance ratio was calculated as

$$\frac{\text{number of children who attended}}{\text{number of children who were registered}} \times 100\%$$

### *Coverage*

The coverage ratio is an estimate of the number of age-eligible children in the community who were registered in the project. The coverage ratio was determined in two ways.

- (i) In 1998, all preschool children in the village were counted during a house-to-house survey. This information was used to calculate the coverage as

$$\frac{\text{number of children who were registered}}{\text{number of children in the village}} \times 100\%$$

- (ii) In 2001, the class list of all school entrants (Grade 1) of the Ndunakazi Primary School was obtained. Children from neighbouring villages and newcomers to the village were identified and excluded. Of the remaining children, those who were previously registered at the *Isizinda* were identified. The coverage ratio was calculated as

$$\frac{\text{number of school entrants who were registered}}{\text{number of school entrants}} \times 100\%$$

### *Age distribution of child contacts*

For each calendar year, the proportion of child contacts per age group, in one year intervals, was summarised.

### *Adequacy of growth monitoring*

For all the children whom were registered in the project from the start (1995) until the end (2000) of the study, the number of times that each child was growth monitored per one-year interval age-category was compared to the guidelines of the INP (*INP Strategy*, 1999).

### *Maternal comprehension of the growth curve*

Maternal comprehension of the growth curve was determined one year after the project was launched. All the caregivers who attended the *Isizinda* during July 1996 were asked to interpret four different growth curves, namely, a growth curve that (i) increases too fast, (ii) is

parallel to the reference curve; (iii) is flattening; and (iv) is going down.

### *Maternal attitude*

At the end of the study, qualitative assessment of maternal attitude of participants and non-participants was done by an independent organisation, namely, the Child Development Programme of the University of Natal, using FGDs. It was reasoned that the mothers might find it embarrassing to voice criticisms to the project staff but might be willing to speak more freely to an independent organisation. FGDs were used because the structured nature of questionnaires is not conducive to the expressions of small doubts about the value of the project. Qualitative data provides insight into the project, that is, how the project is perceived by the beneficiaries and it helps to explore reasons for certain behaviours (Levinson *et al.*, 1999).

FGDs were conducted with four groups of participating mothers, randomly selected from the nine *Isizinda* (eight mothers per FGD). A list of the questions used appears in **Appendix E**. FGDs were further conducted with two groups of mothers who had not been attending the GM sessions during the past year and who appeared to have lost interest in the project. It was explained to them that the purpose of the discussions was to improve the quality of the project and they were asked to voice their honest opinions about the project.

Each FGD lasted about an hour and was facilitated by two Zulu-speaking facilitators. The facilitators had several years of experience with conducting research into health issues. They were trained in conducting discussions using the method described by Kruegar (1998). They made it clear in their introductory remarks to the groups that they (i) were not associated with the running of the project, (ii) would maintain the anonymity of individuals in their report, and (iii) would be interested in both the advantages and disadvantages of the project. While one facilitator chaired the discussion, the other recorded the session and took notes. The information was transcribed and translated.

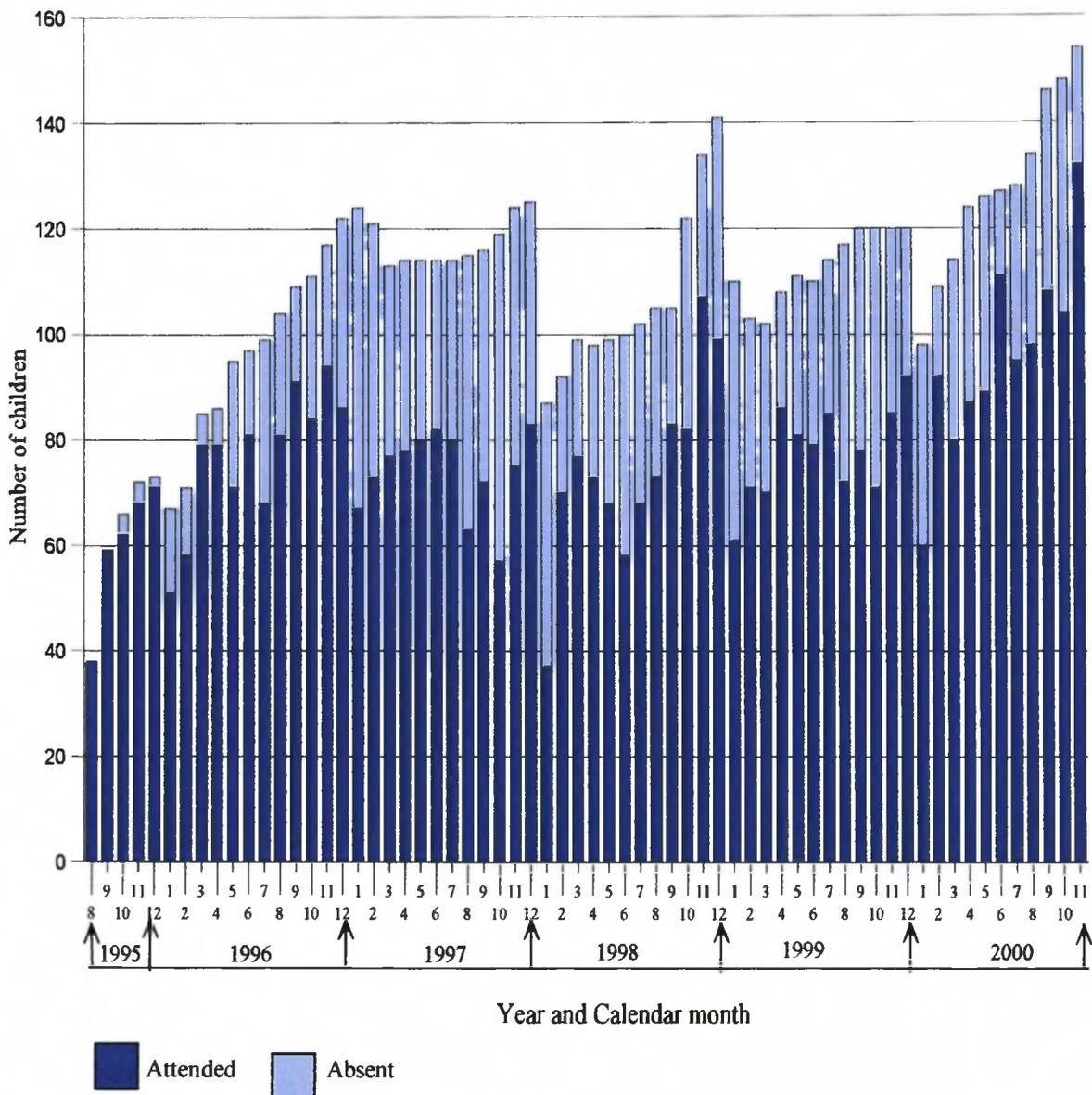
### *Nutrition monitors' attitude*

In 1997 and 2000, the attitude of the nutrition monitors towards the *Isizinda* project was established by means of an open-ended questionnaire (**Appendix F**) that allowed for both positive and negative remarks to be recorded. This was followed by a group discussion.

## 6.2 RESULTS

### 6.2.1 Number of children registered and attending

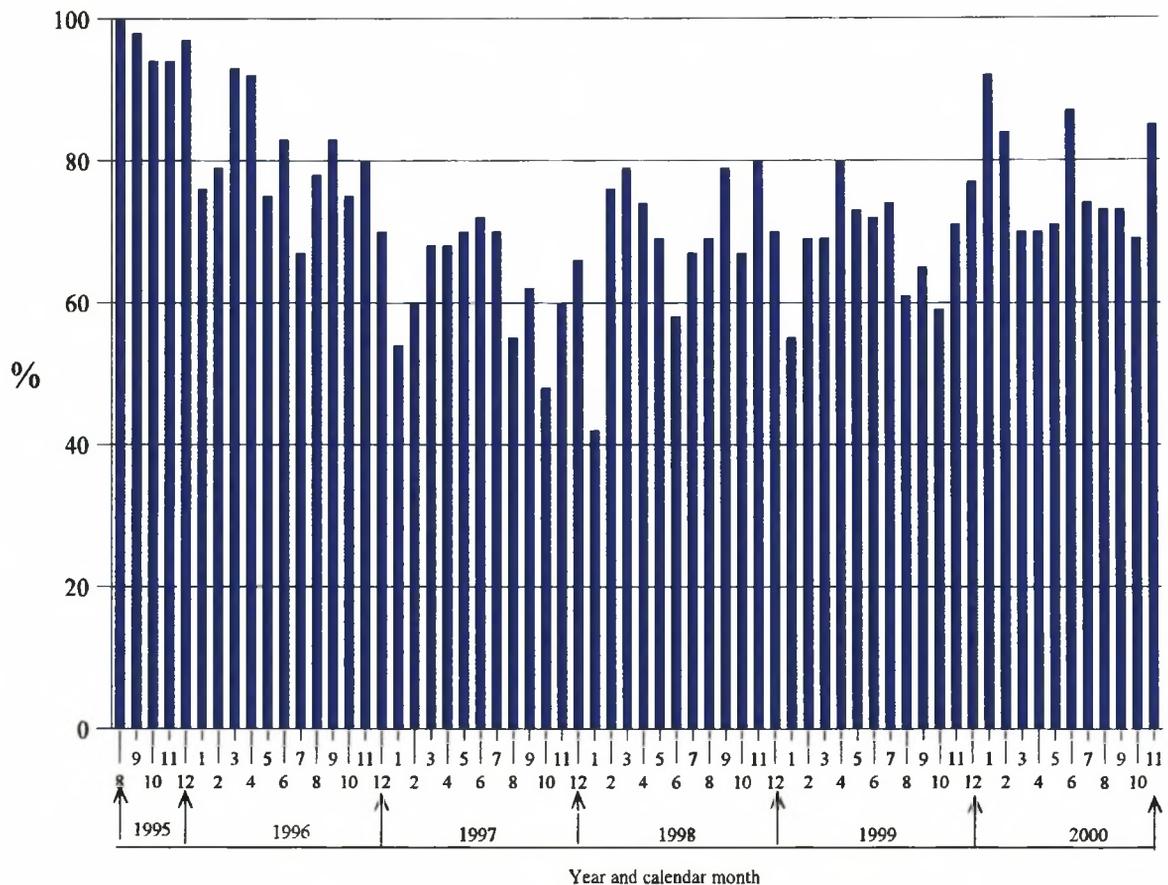
The number of children who were registered and the number of children who attended the *Isizinda* each month during the period 1995-2000 are shown in **FIGURE 6.1**. There were no GM sessions during December 2000 because of local elections.



**FIGURE 6.1:** Monthly attendance of children aged 5 years and younger who were registered in the *Isizinda* project from the start (August 1995) until the end (November 2000) of the study.

Since the launch of the project in August 1995, when 38 children attended the first GM session that was held at the local primary school, the number of children who were registered increased steadily and reached a plateau of 110-120 during 1997. In January each year the number of children who were registered decreased because of children who started schooling. At the beginning of 1998, there was a bigger than usual drop in the number of children who were registered. Grade 0 was introduced at the local school and 4-5-year-old children were allowed to enroll. During the latter half of 1998, the one *Isizinda* was split up into eight smaller *Isizinda* that were integrated with a household food production project. This resulted in a steady increase in the number of children registered at the *Isizinda*.

The attendance ratio, expressed as a proportion of the total number of children who were registered in the project, is shown in **FIGURE 6.2**. The attendance ratio decreased steadily until the end of 1997; in the beginning of 1998 it increased and thereafter it fluctuated mostly between 60% and 80%.



**FIGURE 6.2:** Attendance ratio, expressed as a percentage of all children aged 5 years and younger who were registered in the project, for each month and calendar year from the start (August 1995) until the end (November 2000) of the study.

### 6.2.2 Coverage

Data collected during a house-to-house survey showed that an estimated 90% of all children 5 years and younger were registered in the project. In 2001, a name list of all school entrants (Grade 1) was obtained from the local school. Children who had been registered at the *Isizinda* were identified. Results (TABLE 6.1) showed that of the 22 children from the Ndunakazi village, 20 were previously registered at the *Isizinda*; the coverage is therefore estimated at 91%.

**TABLE 6.1:** The estimated coverage of the *Isizinda* project.

<b>Data from the house-to-house survey</b>		<b>Using the Grade 1 class list for 2001</b>	
<b>Number of preschool children</b>		<b>Number of children</b>	
house-to-house survey	155	on the class list	29
registered in the project	141	not from Ndunakazi	7
		registered at <i>Isizinda</i>	20
<b>Estimated coverage</b>	<b>90%</b>	<b>Estimated coverage</b>	<b>91%</b>

### 6.2.3 Age distribution of child contacts

The proportion of child contacts per age-category (in one year intervals) per calendar year is listed in TABLE 6.2. There was an equal distribution over the age-categories for children under the age of 5 years. The *Isizinda* project did therefore not favour the younger child, as is often the case with *clinic-based* GM (Coetzee & Ferrinho, 1994; Schoeman *et al.*, 2000). During 2000, there was an increase in the number of child contacts for children aged 4 years and older; the vegetables that were cooked at the *Isizinda* as part of the household food production project was probably a motivation for the Grade 0 children to attend the *Isizinda*, either after or during school hours.

**TABLE 6.2:** The age distribution (in one year intervals) of child contacts for each calendar year, for all children who attended the *Isizinda* from the start (1995) until the end (2000) of the study.

Age category	CALENDAR YEAR					
	1995	1996	1997	1998	1999	2000
	n=288	n=926	n=889	n=924	n=952	n=1025
	%	%	%	%	%	%
<1 year	21	21	17	27	20	20
1-<2 years	22	24	22	17	18	17
2-<3 years	16	17	21	20	19	16
3-<4 years	16	20	18	19	21	17
4-<5 years	20	14	17	13	14	20
≥5 years	4	3	5	3	7	10

#### 6.2.4 Adequacy of growth monitoring

The number of times that each child was growth monitored is summarised in **TABLE 6.3**.

According to the guidelines for children in South Africa (*INP Strategy*, 1999), children should be growth monitored at least five times during the first year of life. Nearly two-thirds of infants who were registered at the *Isizinda* met this criteria. For children 1 year and older, at least 70% were growth monitored adequately.

**TABLE 6.3:** The number of times that each child was growth monitored per one-year interval age categories, for all the children who were registered at the *Isizinda* from the start (1995) until the end (2000) of the study.

Number of times	AGE					
	0-<1 years	1-<2 years	2-<3 years	3-<4 years	4-<5 years	5-<6 years
	n=166	n=154	n=149	n=146	n=127	n=70
	%	%	%	%	%	%
1	10	14	11	11	8	19
2	13	6	12	8	10	23
3	5	9	11	8	10	16
4	7	8	5	12	9	14
5	6	9	9	6	11	7
6	9	3	6	7	9	7
7	7	8	5	5	5	4
8	8	6	9	8	4	4
9	8	7	3	9	6	1
10	10	9	8	11	9	3
11	12	11	11	8	6	1
12	4	9	9	8	12	0
<b>Inadequate</b>	35	29	23	19	18	-
<b>Adequate</b>	64	70	76	81	82	-

Guidelines for minimum GM (*INP Strategy*, 1999)

0-12 months: at least five times per year

1-2 years: at least four times per year

2-5 years: at least three times per year

### 6.2.5 Maternal comprehension of the growth curve

All the caregivers who attended the *Isizinda* during July 1996 ( $n=68$ ), one year after the launch of the project, were interviewed. All the caregivers could identify a flattened growth curve as well as a growth curve of a child that was losing weight; 92% could identify the growth chart of a well growing child; and 88% could identify the growth curve of a child that is gaining weight too fast.

## 6.2.6 Maternal attitude

### (i) Mothers attending the *Isizinda*

Results of the FGDs with mothers who attended the *Isizinda* are summarised in TABLE 6.4.

**TABLE 6.4:** Maternal attitude towards the project as determined by focus group discussions with mothers who attended the *Isizinda*.

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#### OPINIONS OF THE PROJECT

##### *What has been learned*

- ▶ They learned that poor growth was a cause of concern and the child's weight should be checked regularly and correctly.
- ▶ They learned how to monitor weight changes.
- ▶ The general belief was that the child should gain weight.
- ▶ Gained understanding about the link between weight change, the child's health, and good nutrition.

##### *What was liked about the project*

- ▶ That they were taught how to care better for their children.
- ▶ That they were taught how to check height and weight.
- ▶ The improved health of the children.
- ▶ Information whether their children were ill.

##### *What was disliked about the project*

- ▶ They would have liked more assistance with basic health care.
- ▶ They wanted basic health care and medical supplies at the *Isizinda*.

##### *How do you feel about the way the project was run*

- ▶ The nutrition monitors were trying hard to make the project work.
- ▶ The project was well-run.
- ▶ The close proximity to their homes was convenient and saved transport costs.
- ▶ Good communication style of project team and nutrition monitors was valued.

##### *Your feelings about the weighing project*

- ▶ They were pleased that they understood the link between weight gain and their children's health.
  - ▶ Before the project they were not motivated to take their children for regular GM because the rationale had not been explained to them.
  - ▶ They felt encouraged when they learned their children were growing well.
- 

#### PERCEIVED HEALTH IMPROVEMENT

- ▶ Knowledge gained at the *Isizinda* has helped to treat diarrhoea.
  - ▶ The education changed the caregivers' attitudes about the importance of appropriate weight gain.
- 

#### SUSTAINABILITY OF THE PROJECT

- ▶ There was a strong desire for the project to continue.
  - ▶ The project should continue with local nutrition monitors, but they would need assistance from the project team from time to time.
  - ▶ The extension to other areas was supported.
-

The overall positive comments indicated that the project had won support throughout the community. During the FGDs it became evident that the project had changed the mothers' attitudes about the importance of appropriate weight gain and they felt encouraged when they learned their children were growing well. They recognised the need for regular growth monitoring and they were keen to have their children's weight checked regularly at the *Isizinda*. They were pleased that they understood the link between appropriate weight gain, nutrition and their children's health. The knowledge aspects of the project were valued and the respondents expressed a sense of empowerment regarding the knowledge they had gained.

Overall, the people were satisfied with the way the project was run. On the other hand, they were unhappy with the government's mobile clinic which visited the area infrequently. They viewed the clinic staff in a negative light because they were hostile and unhelpful. Prior to the *Isizinda* project, the mothers were not motivated to take their children to the clinic for regular GM because the rationale was never explained to them. Their experience with the staff of the mobile clinic was that the children were treated but parents were not given any information as to the nature of the problem. At the *Isizinda*, however, they found the nutrition monitors helpful and informative.

Although some of the respondents felt that basic health care should be included in the project, the project clearly had some perceived health benefits. Reduction in mortality and better child health, and more energetic children were cited as valued gains.

The respondents unanimously agreed that the project should be extended to other areas. The mothers were keen for the *Isizinda* project to continue in Ndunakazi. There was a desire for some kind of follow-up support, even if intermittent. Some mothers feared that the gains made in the community, thanks to the *Isizinda* project, would be lost if the MRC team left.

#### **(ii) Mothers not attending the *Isizinda***

FGDs were also held with mothers who either did not attend or who did not attend regularly. They all agreed that the project had been beneficial, but there were changes over time in the views expressed, as listed in **TABLE 6.5**. Some of the issues raised as disadvantages of the project by mothers who attended the *Isizinda* were stated as reasons for dropping out by non-participants. It was as though attitudes had hardened in the course of time.

**TABLE 6.5:** Reasons why mothers do not support the project, as discussed during the focus group discussions with non-participating mothers.

- 
- ▶ No medicines
  - ▶ Too busy
  - ▶ The *Isizinda* were hosted at a household: the dogs barked at them; the children ran up and down; sometimes special events (eg. deaths) upset the *Isizinda* meetings; disputes with the owner of the house
- 

For the non-participants the benefits no longer outweighed the disadvantages. Checking the children's weight was not important enough to warrant a special visit to someone's house. Non-participants complained that they were too busy: one woman was doing beadwork for sale, another was looking after cattle and another was busy with housework. Several people said that it was a nuisance to have to make two trips: to *Isizinda* for weighing and to the clinic for medicines and advice. The fact that the venues were in the people's houses was also seen as a disadvantage: the dogs barked at them, the children ran up and down and there were sometimes special events which upset the *Isizinda* meetings. One such event was a death in the household where the *Isizinda* meeting was due to take place. In more extreme cases there were disputes with the owner of the house which made it impossible to visit the house for the *Isizinda* project.

### 6.2.7 Nutrition monitors' attitude

In 1997, the nutrition monitors expressed the following thoughts on the *Isizinda* project:

"I appreciate this project because it helps the community and encourages them to take good care of their children."

"I am feeling very happy about the Ndunakazi health centres because it helps the community about their children to grow well."

"I feel so happy about the Ndunakazi health centre project because many people get a good knowledge about health and growth of their children."

In 2000, the monitors expressed a positive attitude towards the *Isizinda*. They were happy because the project helped many people and it showed the community the road to health. They were of the opinion that the project should continue and viewed the project of vital importance for the improvement of nutrition in the area through education, GM, and production of nutritious food. They valued the involvement and cooperation of the community and,

according to them, they had a good relationship with the mothers attending the *Isizinda*.

The nutrition monitors viewed regular GM, to see whether the children are growing well or not, as important. According to them the mothers' knowledge had improved because of the *Isizinda* project, and, as a result, they took better care of their children. Since the integration with the household food production project, the community became aware that vitamins are good for their children, and the vitamin A status of the children improved because of vegetables planted in the gardens.

They viewed the fact that some children attended the *Isizinda* on their own as a problem because morbidity data could not be collected and the mothers of these children missed the nutrition education. Some mothers also tended to wait to be called to attend the GM sessions.

The nutrition monitors reckoned that the mothers should be more involved in the *Isizinda* activities, especially nutrition education. As many mothers attended the *Isizinda* regularly, they should be given the opportunity to give the education, under the supervision of a nutrition monitor, in order to show what they have learned. They should also be encouraged to take responsibility for the food preparation. The nutrition monitors felt that the *Isizinda* could be improved by (i) having more mats for the mothers to sit on, (ii) having toys available so that the children could play while they were waiting, (iii) giving the children a chance to sing and recite poems.

# **Chapter 7**

## **DISCUSSION**

## CHAPTER 7 DISCUSSION

The *Isizinda* project was a package of various activities which were based on the findings of the situation assessment. By creating the opportunity for the mothers to have their children growth monitored regularly within the community, the *Isizinda* addressed a specific need that was created by a lack of health facilities within the area. Community-based GM provided a platform for nutrition education and the promotion of nutrition activities. With the integration of a household food production project, the *Isizinda* provided the infrastructure that was needed for developing capacity for agricultural activities within the community. The community-based GM activities were performed by nutrition monitors at home-based centres within the village. The community-based GM project falls within the framework of the INP which is based on an integrated nutrition strategy for South Africa (*INP Strategy*, 1999).

### 7.1 THE *ISIZINDA* PROJECT WITHIN THE FRAMEWORK OF THE INP

In 1995, the DOH initiated the INP with the vision of optimal nutrition for all South Africans (*INP Strategy*, 1999). The *Isizinda* project targeted children under 5 years and addressed one of the focus areas of the INP, namely GM and promotion. Within the INP, the purpose of GM is to contribute towards optimum growth of infants and small children. Although the impact of the *Isizinda* project on the growth of children was not measured for reasons discussed in section 7.12, the *Isizinda* project strived towards optimal growth and health of children. The GM activities were used as a platform for nutrition activities within the INP, such as nutrition education and promotion of breastfeeding practices. After the integration of the household food production project, issues regarding micronutrient malnutrition and household food security were addressed. The INP Strategy (1999) recommends that community-based actions are based on a participatory approach of problem assessment and analysis. There is, however, little clarity on how this process will materialise. The *Isizinda* project is an example of how community-based actions were established based on a participatory approach of problem assessment and analysis. The INP recommends a link between community-based and health facility-based programmes. The *Isizinda* project functioned independent from the DOH, but there was a referral system to the clinic. This was, however, not functioning optimally, and

should be improved.

The staff of the mobile clinic servicing the area expressed their appreciation towards the chairperson of the NPHCC. According to them, the health of the children improved as a result of the *Isizinda* project and the community-based GM reduced their workload enabling them to concentrate on the sick and the elderly, and carry out immunisations. A benefit of community-based GM is that clinic staff will be less burdened with monitoring the growth of relatively healthy children.

In South Africa, with the shift towards PHC (*White Paper on the Transformation of the Health Sstem in South Africa*, 1997), which includes GM in its core package (*The Primary Health Care Service Package for South Africa*, 2000), and GM being a focus area of the INP (*INP Strategy*, 1999), the role of *community-based* GM will probably increase. The national food consumption survey conducted in 1999 showed one in five children to be stunted, and, as a result, regular clinic visits were recommended to ensure adequate growth (Labadarios *et al.*, 2001). Whether recommendations such as these will have a significant impact is, however, doubtful. Firstly, for regular GM, people must have access to PHC facilities, and secondly, questions have been raised concerning the efficacy of *clinic-based* GM (George *et al.*, 1993; Chopra & Sanders, 1997). Clinic staff spend most of their time on medical diagnosis and treatment, are more committed to medical than educational tasks (Reid, 1994), have little time for a consultation (Dyer, 1996), and are often too busy to complete the RTH card (Harrison *et al.*, 1998). Whereas clinic staff are often viewed negatively (Fonn *et al.*, 1998), as was the case in Ndunakazi, the nutrition monitors were seen as helpful and informative.

## **7.2 THE ISIZINDA PROJECT WITHIN THE CONCEPTUAL FRAMEWORK FOR CHILD MALNUTRITION**

From the conceptual framework for child malnutrition (UNICEF, 1990) it is clear that multiple and interrelated determinants are involved in the development of malnutrition, and multifaceted and multi-sectoral approaches are needed to deal with it. Care, in addition to household food security, and access to health care services and a healthy environment are critical for optimal child growth and development. Community-based GM has the potential to address aspects of all three of these underlying causes for child malnutrition at household level, as illustrated in the *Isizinda* project.

### **Care**

The *Isizinda* project was based on the concept that mothers should take better care of their children, firstly, by having them growth monitored regularly, and, secondly, through improved feeding and hygiene practices. Maternal knowledge can influence the mother's caring capacity (Engle *et al.*, 1996). The nutrition education given at the *Isizinda* addressed aspects of four of the six care practices identified by UNICEF (Engle *et al.*, 1997). These were (i) feeding, including breastfeeding and complementary feeding practices; (ii) food preparation; (iii) hygiene practices; and (iv) home health practices.

### **Household food security**

Household food security depends on the financial, physical and social *access* to food of good quality and sufficient quantity (UNICEF, 1998). During the situation assessment, the Ndunakazi children presented with a high prevalence of vitamin A deficiency (Oelofse *et al.*, 1999). Promoting the consumption of foods rich in vitamin A would have been of little benefit, because, firstly, foods of animal origin were not within their financial reach, and, secondly, most vitamin A-rich fruits and vegetables were unavailable in the area (personal observation). Because of the captive audience, the community-based GM activities provided an ideal platform for the promotion of local production of these fruits and vegetables. For a consistent supply of dark-green leafy and yellow vegetables, it was essential that staggered planting and cyclic production was being promoted continuously. This would have been very difficult to obtain without the platform that the monthly GM activities provided. With the integration of the household food production activities, the project addressed aspects of household food security.

### **Access to health services and a healthy environment**

An essential element of good health is access to curative and *preventative* health services that are affordable, of good quality and within a reasonable distance (UNICEF, 1998). For people in rural areas where there is a lack of health facilities, travelling to the nearest clinic has time and cost implications. The close proximity of the *Isizinda* to their homes was appreciated by the Ndunakazi mothers and saved transport costs. The *Isizinda* project did not only bring preventative health services into the community, but also falls within the INP which strives to develop outreach strategies to ensure that all children younger than 6 years are adequately

growth monitored (*INP Strategy*, 1999). Preventive health and nutrition services are less noticeable to communities and are therefore often less in demand than curative care. Prevention, nonetheless, is vital and cost-effective, and the challenge should therefore be to create a preventive health and nutritional care component. (UNICEF, 1998).

In terms of environmental health, the lack of ready access to safe water supply and proper sanitation, the unhygienic handling of food and the unhygienic conditions in and around homes have significant implications for the spread of infectious diseases, especially childhood diarrhoea (UNICEF, 1998). It was beyond the scope of the MRC to provide the village with access to clean water and a sanitation system, but the mothers who attended the *Isizinda* were taught how to improve their environmental health through, for example, the boiling of river water before consumption and the safe handling and storage of weaning food.

### 7.3 THE ESTABLISHMENT OF THE PROJECT

The project had a positive start in that it was initiated at the request of the community. Entry into the Ndunakazi village was a gradual process. Through the NPHCC, a link between the MRC and the community was established. This facilitated the exchange of information and enabled the community to be involved in the decision-making processes. The NPHCC enabled the MRC to liaise with individuals and the community, without developing personal friendships or hardships that could have led to unwanted outcomes.

The NPHCC was established with relative ease, probably because this process was facilitated by a well-respected and prominent figure in the community (headmaster of the local school). The importance of involving prominent community figures in the establishment of representative community health committees has been described in the literature (De Villiers & De Villiers, 1996).

Knowledge of the nutritional situation and its causes within the village was needed to identify an appropriate strategy to address malnutrition. No information on the Ndunakazi village was available and the community was regarded as the best source of information about itself. During the situation assessment, the community's views on its needs and concerns were assessed using a participatory approach (focus group discussions and interviews).

## 7.4 PURPOSE OF THE COMMUNITY-BASED GROWTH MONITORING ACTIVITIES

GM can be used as a screening tool, for education and promotion purposes, for nutrition surveillance, and as an integration strategy (Chopra & Sanders, 1997).

### 7.4.1 Growth monitoring as screening tool

At the *Isizinda*, GM was used for screening and appropriate actions were suggested when the growth curve deviated from the norm. In addition, a health promoting culture was stimulated and mothers were encouraged when they learned that their children were growing well.

Nabaro and Chinnock (1988) implied that the reasons for growth faltering may be too complex for health workers to unravel. At the *Isizinda*, the recorded morbidity data helped the nutrition monitors to interpret a sudden weight loss and also helped them to counsel the mothers when a sudden weight loss occurred. Although guidelines were available for counselling (see **TABLE 4.2** and **TABLE 4.5**), the use of a structured flow chart, based on the concept of the diagnostic counselling and treatment cards for diarrhoea that are used in Indonesia (Sutisnaputra *et al.*, 1993), should be developed and tested.

Individual children with problems were identified and referred to the clinic. Although the information system (**Appendix D**) at the *Isizinda* allowed for clinic referrals to be recorded (in the "comments" column), this was seldom done. The information system should be redesigned to allow a more systematic recording of clinic referrals as this will help the nutrition monitors to follow-up the children. The information system should, however, be kept simple to avoid that the *Isizinda* are transformed into a number of routine, impersonal and repetitive administrative tasks, as is often the case in clinics (Reid, 1984).

The referral system was well accepted by the clinic staff and the curative services of the clinic were strengthened. Because of its high coverage, community-based GM can be used to screen children for selective referral to PHC facilities in an attempt to reduce the inappropriate utilisation of hospital services in the country (London & Bachmann, 1997; Power *et al.*, 1997). This can lead to a more efficient health care delivery system.

#### 7.4.2 Growth monitoring as platform for nutrition education

At the *Isizinda*, counselling based on GM and morbidity data emphasised the significance of growth faltering and malnutrition. From the FGDs it was clear that the mothers had learned that poor growth was a cause for concern and understood the rationale behind regular GM. The nutrition education at the *Isizinda* created an awareness of the causes and consequences of malnutrition, which is considered a success factor for nutrition programmes (Allen & Gillespie, 2001). It also stressed the importance of learning from the experience of mothers, as was the case in Jamkhed, India (Arole, 1988).

The linear graph is a difficult concept to grasp (Morley, 1997), and in South Africa, clinic staff were shown to have difficulty in understanding the graph and plotting weight accurately (Harrison *et al.*, 1998). Although no baseline data is available on maternal comprehension of the growth curve, it can be assumed that it was low. In a neighbouring village that has an extensive CHW programme and established health facilities, less than 30% of the mothers comprehended the growth curve (unpublished data).

The high level of comprehension for the mothers who attended the *Isizinda* could probably, at least partly, be attributed to the fact that the growth curve was plotted and explained to them by nutrition monitors who were of similar socio-economic background. Clinic staff have tertiary education and often Westernised lifestyles, resulting in a wide gap between nurses and the community (Reid, 1984). This was illustrated in India where social workers were more successful in using GM data to stimulate community actions, compared to health staff (Arole, 1998).

The impact of the nutrition education on maternal knowledge was not measured because of the lack of (i) a control group and (ii) appropriate baseline data. However, data from the household food production project showed that maternal knowledge regarding nutritional issues can be improved through nutrition education given at the GM sessions (Faber *et al.* 2001b).

The use of GM for nutrition education is effective only if the messages are understood and translated into action (Chopra & Sanders, 1997). Since the introduction of the *Isizinda* project, changes in behaviour have been reported. For example, the average age for introducing solid foods reported in 1995 was  $2.8 \pm 0.8$  months (Faber *et al.*, 1997) versus  $3.6 \pm 0.8$  months as reported during 1997 (Faber & Benadé, 1999). Another example is an

increased intake of vitamin A-rich foods (Faber *et al.* 2002) since the introduction of the education lessons on vitamin A nutrition.

Although the mothers' involvement in the education lessons increased as the project progressed, the nutrition monitors recommended that the involvement of the mothers be increased even more. This is possible, as was shown in Indonesia (Mantra *et al.*, 1993), and needs to be explored in the Ndunakazi village.

Health workers need to have enough time for nutrition education (Chopra & Sanders, 1997) and the GM sessions should be limited in size so that counselling can be conducted properly (UNICEF, 1990). Originally, there was only one *Isizinda* in the Ndunakazi village, hosting more than 100 children. Although this *Isizinda* operated for three consecutive days each month, the number of children attending was often not spread evenly over the three days, and at times, the nutrition monitors could not cope with the workload and the nutrition education was often neglected. Since the latter half of 1998, the *Isizinda* became much smaller and more time was allocated to nutrition education. From the FGDs it was clear that the mothers valued the knowledge that they had gained from the project.

Nutrition education for caregivers is an important component of the *INP Strategy* (1999). According to Ladzani *et al.*, (2000), there is little clarity regarding by whom, and how, the nutrition education component will be implemented. The *Isizinda* project showed that community-based GM can provide a platform for nutrition education.

### **7.4.3 Growth monitoring for surveillance**

UNICEF (1994) recognised the importance of nutritional status, as obtained through nutrition surveillance, as a sensitive indicator of socio-economic development in South Africa. Although the use of *clinic-based* GM data for nutrition surveillance has been recommended (Fincham *et al.*, 1996), concerns have been raised (Chopra & Sanders, 1997) because of the low coverage (Schoeman *et al.*, 2000), especially for older children (Coetzee & Ferrinho, 1994), and non-representativeness (Coetzee & Ferrinho, 1994; Solarsh *et al.*, 1994) of clinic-based GM data.

The high coverage, equal distribution of child contacts over the various age categories, and representativeness of the *Isizinda* data suggest that community-based GM is a viable option to be included in a national nutrition surveillance system. It can play a fundamental role in the monitoring and evaluation of nutrition programmes and the nutritional

goals of the INP. It should be investigated whether similar approaches can be used in other rural areas and in areas where there are no established health facilities.

#### 7.4.4 Growth monitoring as an integrating strategy

Malnutrition is the result of many factors, and the most successful nutrition programmes are usually those that combine various nutrition components (UNICEF, 1998). Because of the captive audience, GM has the potential to create a forum through which various activities can be provided, such as, family planning, immunisation, control of diarrhoeal disease, productive skills training, basic sanitation (Leimena, 1989), and malaria control (Mantra, 1992). The availability of various activities can make the weighing programme more attractive for mothers, and the integration of nutrition interventions makes the programmes more cost-effective (Allen & Gillespie, 2001). In several successful large-scale PHC and nutrition programmes, GM is viewed as a key to success (Giffiths *et al.*, 1996).

Because of extensive micronutrient-deficient dietary intakes of South African children, the promotion and strengthening of home-based crops have been recommended, especially for rural areas (Labadarios *et al.*, 2001). Whereas several home garden projects in South Africa failed (Strachan, 1999), the *Isizinda* project increased the level of capacity to implement the household food production project, which proved to be successful (Faber *et al.*, 2001c; Faber *et al.*, 2002; Faber *et al.*, in press). The *Isizinda* provided the infrastructure for promotion and served as training centres for the agricultural activities. The infrastructure of community-based GM was the platform for nutrition education which resulted in improved knowledge regarding vitamin A nutrition (Faber *et al.*, in press). The uniqueness of the integrated *Isizinda* project lies in the combination of agriculture, health, nutrition and educational activities. A contributing factor to the success of the household food production project was probably the mothers' understanding of the underlying factors for poor growth and health of their children. The community related the integrated project to poverty alleviation (Faber *et al.*, 2001b). This, in the long-term, could have a powerful effect because it could potentially empower the community to social upliftment.

The potential of GM to integrate activities will be further explored when, in one of the neighbouring villages, the community-based GM project will be integrated with a mobile clinic which will serve as training centre for pharmaceutical students. The mobile clinic will be

sponsored by an NGO, it will be run by the Pharmaceutical Society of South Africa and essential drugs will be provided by the DOH.

## 7.5 NUTRITION MONITORS

### 7.5.1 Training

In the developing world, CHWs play an important role in PHC programmes (Melville *et al.*, 1995). However, insufficient training has a negative effect on their performance (Gopaldas, 1988; Mantra *et al.*, 1993). Appropriate training is imperative to ensure that they have the knowledge and skills to perform their duties (Coetzee & Ferrinho, 1994; Chopra & Sanders, 1997) as this will enhance the success and sustainability of the programmes (Aubel & Sambandure, 1996).

The nutrition monitors appreciated the theoretical aspects of the training, as it helped them in counselling the mothers and gave them a better understanding of the GM activities. The training was targeted at problem solving, technical ability and efficiency. The training programme was not rigid and allowed flexibility to address specific needs as they arose.

Although nine nutrition monitors were trained to perform the GM activities, only two were allocated exclusively to the *Isizinda* project. The Ndunakazi project included the training of trainers. The three nutrition monitors who were recruited and trained when the project was initiated acted as trainers for newly appointed nutrition monitors. Training of health workers by peers has been proposed as an efficient, effective, and sustainable training strategy and has the potential to be more successful than “official” training courses (Robinson *et al.*, 1998).

During 2000, one of the nutrition monitors, under the supervision of the project leader, trained 20 CHWs in KwaZulu-Natal for a UNICEF funded community-based multi-centre infant supplementation study (Smuts *et al.*, 2002) and in 2001, five nutrition monitors trained 60 CHWs for a community-based placebo-controlled trial. It is envisaged that, should community-based GM activities be initiated in other rural villages in KwaZulu-Natal, the Ndunakazi nutrition monitors can act as trainers. This will make the training of nutrition monitors more realistic and task-orientated. It will enlarge the network of skilled people and it will enhance the impact, success and sustainability of community-based GM projects. For this to materialise, it is important that a structured training schedule, such as those used in

Indonesia (Mantra *et al.*, 1993) and Tanzania (Jennings *et al.*, 1991), be formalised. In addition, a training manual should be developed, based on the Ndunakazi experience. It has been suggested that such manuals can be used by other programmes, provided that they are tested and adapted for local conditions (Parlato & Gottert, 1998).

### 7.5.2 Selection of nutrition monitors

The selection of volunteers or CHWs is often out of the hands of the project leader. They are often selected by either village heads (Mantra *et al.*, 1993) or village health committees (Chorlton, 1989), as was the case in Ndunakazi where the nutrition monitors were selected by the NPHCC. Whereas, in Indonesia, for example, the drop-out rate of volunteers during the first year was approximately 50% (Mantra *et al.*, 1993), the nutrition monitors have been in the project for a substantial period of time, working under difficult conditions. During the course of the project, nine nutrition monitors were trained, of whom one has resigned. The low drop-out rate can be ascribed to (i) the fact that they were employed, (ii) the objectiveness with which they were selected and the understanding of especially the project manager of what was expected, and (iii) the comprehensive training which gave them the confidence to perform their duties. As rightly stated by Mantra *et al.* (1993), criteria should be set for the selection of CHWs, with probably the most important being that they should be able to communicate what they have learned to the community and that their selection should be endorsed by the community.

Griffiths *et al.*, (1996) recommended that the person responsible for community-based GM should be from the community. An advantage of using local people is that they know the area and are familiar with the circumstances within the village. Based on the Ndunakazi experience, a major disadvantage of using local nutrition monitors is that conflict within the village can influence the project activities. The nutrition monitors who did not live in the village were not affected by such conflict, and they seemed to be more respected than the local nutrition monitors. However, they were dependent on public transport to get to work, which was costly and, at times, unreliable.

### 7.5.3 Number of nutrition monitors needed

The nutrition monitors used for the GM project did not spend all their time on the latter project because they were also involved in a number of other research activities. It is therefore not possible to give an exact estimate of the number of monitors needed to run a GM project involving approximately 120-150 children. However, it is estimated that one or two nutrition monitors will be able to run the project (including the agricultural and nutritional activities). Their workload can be reduced by involving community members (Griffiths *et al.*, 1996). The Ndunakazi community is gradually taking more responsibility for the integrated project. The number of nutrition monitors has been reduced (there are indications that either one or two nutrition monitors will be able to perform the GM and agricultural activities), the role of the MRC has been scaled down, and the involvement and responsibilities of volunteers have increased. By transferring the responsibility of the activities to the community the project will have a greater chance of long-term sustainability.

## 7.6 HOME-BASED POINTS FOR GROWTH MONITORING

In some nutrition programmes, GM is done from house-to-house (Chopra *et al.*, 1996; Griffiths *et al.*, 1996). This was not a viable option for the Ndunakazi village because of the low population density, the mountainous nature of the area and poor transport system. Hosting the GM sessions at households created a social and relaxed atmosphere, and having small groups of mothers together provided the opportunity to use the GM sessions as training centres for the agricultural activities.

Measuring the children under the adverse conditions in the Ndunakazi village was not always easy. The *Isizinda* were hosted in the dwelling of a household which usually was a hut with one or two small windows, the rooms were often dark inside and the floors often uneven.

Hosting the *Isizinda* at a household was not acceptable to all the mothers and it prevented some to participate. Although this is not seen as a major problem because of the high coverage of the project, it could be worthwhile to investigate other options to accommodate this small group of mothers. Structures such as a neighbourhood hall (Mantra *et al.*, 1993), church buildings, schools and crèches (Schoeman *et al.*, 2000) can be used, if available.

It has been argued that, in developing countries where funds are limited, communities should share the burden of providing health improvements through contributions of labour, materials and money (Shisana & Versfeld, 1993). The Ndunakazi community did not contribute financially towards the *Isizinda* project, but, because their homes were used as GM points, there was no need to invest in buildings.

## 7.7 MEASUREMENTS

The Ndunakazi children were weighed on electronic scales. These scales are, however, not a viable option for community-based GM programmes as they are expensive, sensitive, fragile and need a continuous supply of batteries. The DRS had been used in local studies (Kuhn & Zwarenstein, 1990; Coetzee & Ferrinho, 1994) and may be a more viable option. Mothers can benefit by using the DRS (Meegan *et al.*, 1994; Meegan & Morley, 1999).

When using the DRS, the upper end of the spring is attached to a hook, a beam in the house or a branch of a tree. Although the use of a tree branch can be a suitable option in a rural village, it is not a suitable option for rainy days. Most of the dwellings in the Ndunakazi village are traditional round huts. There are no beams in the house and it is questionable whether it will be acceptable to install a hook specifically for the DRS. A possibility will be the use of a special stand for the DRS, or a drip stand (Coetzee & Ferrinho, 1994). An in-depth survey needs to be conducted to investigate the pros and cons of available scales to determine which scale is the most practical to be used for community-based GM. The important criteria for choosing scales are accuracy, portability, durability, universality, minimum reading and recording errors, ability to be purchased and repaired locally, and acceptability to the community (Gerein, 1988).

Although height measurements are recorded in some private clinics (Harrison *et al.*, 1998), most clinic-based GM programmes only include weight measurements. In South Africa, as was the case in Ndunakazi, the prevalence of stunting is higher than the prevalence of either underweight or wasting (South African Vitamin A Consultative Group, 1996; Labadarios *et al.*, 2001) and, as a result, the inclusion of height measurements in GM programmes has been suggested (Coetzee & Ferrinho, 1994; Labadarios *et al.*, 2001). Routine height measurements for GM have too low a sensitivity and specificity to be regarded as a screening tool (Hall, 2000), but can be used for nutrition surveillance. Height measurements are time-consuming

and, as they are not plotted on the growth chart, *monthly* height measurements have little purpose. Six-monthly or annual measurements would probably be sufficient and more acceptable.

## 7.8 MANAGEMENT OF THE PROJECT

The management of the *Isizinda* project had two strong points. Firstly, the project leader, from time to time, worked with the nutrition monitors in the community, thereby ensuring that project activities were practical and relevant to local conditions. The work load of the nutrition monitors and the logistics of the weighing sessions, which were important to ensure the success of the project (De Alvarado & Griffiths, 1998), were therefore monitored continuously.

Secondly, the project was managed at community level. Ineffective management is a common stumbling block in community-based nutrition programmes (Ndure *et al.*, 1999). It was, therefore, important to have a project manager to coordinate and supervise the activities at community level. As the project manager was the headmaster of the local school, daily supervision of the community-based activities was possible. His strong, dedicated and enthusiastic leadership was invaluable. Communities with weak leadership often lag behind (Jennings *et al.*, 1991), and the *Isizinda* endorsed the importance of a strong leader and good manager.

## 7.9 COVERAGE AND ATTENDANCE

Infrequent attendance, low coverage (Coetzee & Ferrinho, 1994) and non-representativeness of clinic attenders (Cape, 1988; Gerein & Ross, 1991) have raised concerns regarding clinic-based GM. Mothers usually find it difficult to adhere to regular weighing of their children, and they often wait until the child is very ill before taking the child to the clinic (Chorlton, 1989; Schoeman *et al.*, 2000). However, it is estimated that approximately 90% of the Ndunakazi preschool children were covered, and at least 60% of the children who were registered were covered adequately according to the guidelines defined by the INP (*INP Strategy*, 1999). This is a remarkable improvement as children in the area were previously growth monitored mostly on immunisations dates only, and, as in other countries (Mapatano *et al.*, 1997), most children

were not growth monitored after completion of the immunisation scheme with less than 50% of children older than 2 years being in possession of an RTH card.

Whereas the literature shows a strong bias of clinic data towards the younger child (Coetzee & Ferrinho, 1994; Mapatano *et al.*, 1997), the *Isizinda* data showed an equal distribution over the age categories for all children younger than 5 years. A benefit of the *Isizinda* project was, therefore, that the older children (> 2 years) were growth monitored regularly, and as such, their caregivers had access to the nutrition education.

The high coverage and attendance ratio, equal distribution over the age-categories and representativeness of the *Isizinda* project suggest that community-based GM is a viable option to be used for screening and nutrition surveillance. Because of the high coverage and attendance ratio, the GM activities are an ideal platform for other nutrition activities such as, for example, the agricultural activities.

## **7.10 MATERNAL ATTITUDE**

Maternal satisfaction with project activities is a good indicator to be used in programme evaluations (Garner *et al.*, 2000). Communities often view monthly GM as a reflection of their pride in their future generation (Arole, 1988). As in India, where mothers appreciated the GM process and viewed the monthly GM as an important opportunity to be assured about the health of their children (Chaudhuri, 1988), the Ndunakazi mothers were appreciative towards the *Isizinda* project because of a better understanding of the benefits of regular GM. The community was enthusiastic about the *Isizinda* project and had a strong desire for the project to continue.

## **7.11 SUSTAINABILITY**

Community-based projects need the support of the health care planners in order to ensure adequate funding (Shisana & Versfeld, 1993; De Villiers & De Villiers, 1996). The MRC and representatives from the Ndunakazi community tried for several years to establish a partnership with the DOH of KwaZulu-Natal. Should the DOH take long term responsibility for the community-based GM activities in Ndunakazi, the sustainability of the project will increase.

## 7.12 HEALTH AND NUTRITIONAL STATUS

### 7.12.1 Prevalence of diarrhoea

From the conceptual framework for malnutrition, as adopted for SA (Steyn, 2000), it is clear that malnutrition can be addressed through the control of diarrhoeal disease. Since the establishment of the *Isizinda* project in 1995, the prevalence of diarrhoea showed a steady decrease. This can probably, to some extent, be ascribed to the education lessons given at the *Isizinda*. The installation of taps in 1999, and the improved vitamin A status resulting from the household food production project (Faber *et al.*, in press) could have contributed towards the decline in the prevalence of diarrhoea during the last two years of the study.

### 7.12.2 Nutritional status

A shortcoming of the *Isizinda* project was the lack of a suitable control group, making it difficult to measure the effect of community-based GM *per se* on nutritional status. Inclusion of a control group is important to control for historical and maturation effects, testing effects and regression to the mean (Levinson *et al.*, 1999). The neighbouring village, which was included in the situation assessment, could have been a suitable control village. However, the GM activities were extended to this village at the request of the people.

The scope of the study was probably also too small to measure impact. The only study in the literature that measured the impact of GM *per se* on nutritional status was a large ecological study, including 40 municipalities, that showed that GM has the potential to improve nutritional status (De Souza *et al.*, 1999).

Evaluating the effect of GM programmes on nutritional status is difficult. While the randomised, double-blind, controlled trial is the accepted gold standard of interventions delivered at individual level (Kirkwood *et al.*, 1997), participants in community programmes are self selective and randomisation within a community is neither practical nor ethical.

In Ndunakazi, community-based GM through home-based centres was acceptable to the mothers and a high coverage and attendance ratio were achieved. The next step would be to evaluate the effect of community-based GM on the nutritional status of children through a cluster-randomised controlled trial. For this, at least 12 comparable villages should be selected

and randomly allocated to either the experimental group or control group (Garner *et al.*, 2000). Pre and post measurements must be taken to measure the change in nutritional status (Levinson *et al.*, 1999).

The nutritional status of children is associated with social factors (Kuhn *et al.*, 1990; Krige & Senekal, 1997; Faber & Benadé, 2000), and it is, therefore, unlikely that GM on its own will produce *dramatic* changes in the nutritional status of the children. For example, in the Ciskei, the strengthening of GM did not have an effect on the widespread undernutrition (Kuhn *et al.*, 1990). As stated by Aubele & Samba-Ndure (1996), there are limits to the impact that a nutrition programme can have on a population of poor people. In these populations, political commitment at national level to sustainable and equitable economic growth and social development is essential to improve the nutritional status and well-being of the population. Although community-based GM *per se* cannot impact on the broader social factors, the infrastructure provided can be used to teach mothers to make optimum use of available resources. GM should, therefore, not function in isolation, but be integrated with other PHC or community development activities, such as the household food production project in Ndunakazi.

### 7.12.3 Effect of the integrated *Isizinda* project

The integrated *Isizinda* project showed that, when GM is integrated with agricultural activities, a significant improvement in child malnutrition can be obtained (Faber *et al.*, in press). The scope of the integrating potential of GM is demonstrated by the variety of integrated activities that were shown to improve nutritional status, such as, for example, feeding programmes (Sternin *et al.*, 1997), food supplements (Melville *et al.*, 1995), and community development activities (Arole, 1988).

In both India (Arole, 1998) and Tanzania (Jeje, 1997), GM data was used to monitor the progress of rural development programmes. In Ndunakazi, the *Isizinda* was used not only to monitor the progress of a local food production project, but also for promotion, and served as training centres for the agricultural activities. The infrastructure of community-based GM was the platform for nutrition education which resulted in improved knowledge regarding vitamin A nutrition (Faber *et al.*, in press). Although there was a seasonal effect (Faber *et al.*, 2001c), the agricultural activities had a positive effect on the vitamin A intake (Faber *et al.*,

2002) and ultimately the vitamin A status (Faber *et al.*, in press) of the children.

## 7.13 STRENGTHS OF THE PROJECT

### *(i) Based on the need of the community*

The project was initiated at the request of the community, and was, therefore, need driven.

### *(ii) Participatory approach*

The project was established using a participatory approach and the community was involved from the outset. This was vital to break down resistance to project activities, and to expand the knowledge of nutritional issues at community level. The Ndunakazi community changed from passive recipients of health care services to active participants in community-based GM, thereby promoting a sense of ownership and sustainability of the project (Aubel & Samba-Ndure, 1996).

An underlying concept of PHC is the involvement of the community in decisions about its health (Gerein, 1988) and as was the case in several other community-based nutrition projects (Leimena, 1989; Mantra, 1992; Jeje 1997), the Ndunakazi community was guided in identifying their own needs. This ensured that the interrelationship of various social, economic and environmental issues affecting the child's health was taken into consideration. By making use of local knowledge, the conceptualisation process was improved. During the initial planning workshop, an opportunity was created for the Ndunakazi community, with facilitation, to find solutions for their problems in an open and participatory approach. This ensured that the project complied with local needs, perceptions, resources and norms. This was important as interventions based on established values and practices are more readily accepted than unfamiliar ones, and their acceptance tends to be more sustainable (Aubel & Samba-Ndure, 1996).

Community participation is one of the best ways to cut across the barriers of culture and language (Shisana & Versfeld, 1993). The establishment of the NPHCC and the regular community meetings ensured that decisions were taken *with* the community and not *for* the community.

Regular community meetings provided the opportunity for feedback and discussion of relevant issues. All aspects of the project were conducted in collaboration with the community,

and during these meetings consensus on project modifications, when needed, was obtained. The fact that these meetings were, at times, integrated with community meetings that were held to discuss non-project related community issues, showed that the *Isizinda* project was accepted as a community activity, belonging to the community and not the MRC. During these meetings, great care was taken not to create expectations that could not be met.

Community participation can be a slow and frustrating process that is often restrained by rigid professionalism on the part of health personnel claiming a monopoly on health knowledge and management (De Villiers & De Villiers, 1996). This, however, was not the case in Ndunakazi, as there were no established health facilities.

### ***(iii) Support from village leaders***

Village leaders and prominent figures within the village were continuously involved and contributed towards decision-making throughout the project. Their continuous support was important for lending credibility to the project and helping to ensure its success and sustainability (*Guidelines for Participatory Nutrition Projects*, 1993).

### ***(iv) Managed at community level***

The project was managed at community level by the headmaster of the local school. This enabled the daily supervision of the community-based activities.

## **7.14 LIMITATIONS OF THE PROJECT**

### ***(i) Lack of control group***

The study did not include a control group and, as a result, the impact on nutritional status was not be measured. Because impact was not measured, cost effectiveness could not be measured.

## **7.15 CONCLUDING REMARKS**

In line with the guidelines for the CBNP (*INP Strategy, 1999*), actions aimed at improving the understanding of nutritional issues and household food security were defined and decided on in the Ndunakazi village. The *Isizinda* project is a practical example of how scientific results, when carried out in partnership with the community and with the objective to address the

needs of the community, can form the basis for community-based nutrition projects.

The *Isizinda* project falls within the INP and it can bridge the gap in areas which lack established health facilities. Although the *Isizinda* project was established in a rural area that lacked health facilities, community-based GM can be implemented in urban areas (Kaye & Novell, 1994; Schoeman *et al.*, 2000) and it can be used to complement existing health facilities in communities where there are established health facilities (Schoeman *et al.*, 2000).

# **Chapter 8**

**SYNOPSIS OF PROJECT ACTIVITIES,  
RESULTS, CONCLUSIONS AND  
RECOMMENDATIONS OF THE STUDY**

## CHAPTER 8

### SYNOPSIS OF PROJECT ACTIVITIES, RESULTS, CONCLUSIONS AND RECOMMENDATIONS OF THE STUDY

#### 8.1 INTRODUCTION

In 1994, the headmaster of the local school approached the MRC for assistance to address malnutrition in Ndunakazi, a rural village in KwaZulu-Natal. A committee (NPHCC), which served as communication channel between the MRC and the community, was selected. The first phase of the study consisted of a situation assessment which included a cross-sectional survey conducted through house-visits, interviews with key informants from the community and FGDs. The results of the situation assessment were discussed with the NPHCC, and were used during a project planning workshop that was attended by community representatives. An outcome of the workshop was the establishment of a community-based GM project. Households made their homes available, on a voluntary basis, to serve as GM points (called *Isizinda*). Nutrition monitors were trained to perform the activities at the *Isizinda*, which included monthly GM, nutrition education and collection of morbidity data. Children who showed growth faltering or who needed medical attention were referred to the nearest clinic. During the latter half of the study, the GM activities were integrated with a household food production project. The acceptability of the project was determined in terms of attendance and maternal attitude.

#### 8.2 SUMMARY OF THE MAJOR FINDINGS

##### 8.2.1 The situation assessment

From a nutritional point, the situation assessment identified a need for regular GM of infants and small children, increased availability of foods rich in micronutrients, and nutrition education. This section describes the nutritional status of children 5 years and younger, as well as the immediate, underlying and basic causes of child malnutrition in the village.

### **(i) Nutritional status of the child**

The prevalence of stunting doubled during the second year of life. Nearly half (45%) of the preschool children were marginally vitamin A deficient, 24% were anaemic, and 77% had low urinary iodine concentrations (Oelofse *et al.*, 1999).

### **(ii) Immediate causes of child malnutrition**

#### ***Dietary intake***

Children consumed a limited variety of foods. Staple foods were a porridge made with maize meal, rice and beans. Animal foods and fruit were seldom consumed. *Imifino* was the only  $\beta$ -carotene-rich food consumed on a regular basis (Oelofse *et al.*, 1999).

#### ***Diseases***

Diarrhoea was the illness most prevalent. One-third of the mothers had lost a child younger than 5 years. Most of these deaths occurred during the first year of life. Half of the mothers did not know the cause of death. Where the cause of death was known, diarrhoea was associated with two-thirds of the deaths.

### **(iii) Underlying causes of child malnutrition**

#### ***Household food security***

Foods available in the shops were limited, and cabbage, tomatoes, potatoes and onions were the only vegetables sold. Crops planted were mainly maize and beans. More than 70% of the households indicated that they did not always have enough food.

#### ***Care***

Complementary foods were introduced at an early age. The first solid food given to infants was usually a porridge made with maize meal. Unfavourable practices for the treatment of diarrhoea were present, such as giving an enema and withholding solid foods.

#### ***Utilisation of health services***

Approximately 70% of children under 2 years of age were in possession of a RTH card. This figure dropped to 34% for children aged 3 years and older. Most children were growth monitored on immunisation dates only. There were no health facilities in the village. A mobile

clinic was scheduled to serve the area once a month, but this service was irregular and many mothers had to walk long distances to reach the service point. Visiting the nearest clinic, which was 18 km away, was difficult because of the poor transport system.

### ***Environmental conditions***

The village lacked toilet facilities and clean water. Water for household use was collected from the river, which was also used for swimming, bathing, and washing. This made the river water a potential health hazard. Most of the mothers realised that the river water was unsafe for human consumption, but only 10% boiled the water before consumption, thereby increasing the risk for diarrhoea.

### **(iv) Basic causes of child malnutrition**

#### ***Socio-economic conditions***

The unemployment rate was 33%, and 15% of the households had no cash income.

#### ***Community resources and structures***

The condition of the roads was poor and transport in and out of the area was available once a day only. There were no telephones. Only a few households had access to electricity.

## **8.2.2 Project planning workshop**

During this workshop it was clear that the health of the preschool children was of great concern to the community and the relationship between health and growth of children was well understood. The community representatives realised that the lack of health facilities within the area would not be resolved in the near future and their need for regular weighing of the children was included in the plan of action.

## **8.2.3 Community-based growth monitoring project**

### ***Growth monitoring points (Isizinda)***

The project was run by nutrition monitors through home-based centres, called *Isizinda*. Families made their homes available on a voluntary basis, once a month, as part of their

commitment and contribution towards the project. Criteria for selecting suitable households were geographical location, accessibility, number of preschool children in the vicinity of the household, willingness of the mother to participate and availability of space in the dwelling. An *Isizinda* should serve a minimum of 8-10 children (to make it worthwhile for the nutrition monitors), and, depending on the size of the dwelling, a maximum of 20-25 children.

### ***Growth monitoring***

The core activity at the *Isizinda* was monthly GM. The weight of the children were plotted on the growth chart. The growth curve of the child was used to counsel the mother. Children who showed growth faltering were referred to the nearest clinic and followed up by the nutrition monitor.

### ***Nutrition education***

The findings of the situation assessment were used to identify key messages for the nutrition education. The nutrition education lessons were developed as the project progressed, and the needs of the mothers dictated new topics. Concise, inexpensive education material was developed through (i) discussions with the nutrition monitors, (ii) observation, and (iii) feedback from the mothers and nutrition monitors. The nutrition education was given in group situations as well as to mothers individually, where needed.

### ***Collection of morbidity and mortality data***

Appropriate morbidity data was collected each month. This helped the nutrition monitor to interpret the growth curve and to counsel the mother.

### ***Referral system to the nearest clinic***

Children who showed growth faltering or who were in need of medical attention were referred to the nearest clinic and followed up by the nutrition monitors.

### ***Integration with a household food production project***

During the latter half of the study, the *Isizinda* project was integrated with a household food production project that focussed on addressing vitamin A deficiency. A demonstration garden, which served as training centre, was established at each *Isizinda*, and education regarding

vitamin A nutrition was introduced. On GM days, vegetables from the demonstration garden were harvested and prepared, and all children who attended the GM session enjoyed these vegetables. This was used to (i) introduce the mothers and children to these vegetables, (ii) teach the mothers various ways of preparation, and (iii) give the mothers the opportunity to observe their children eat (and enjoy) it. The latter served as motivation for the mothers to plant these vegetables at household level.

### ***Management of the Isizinda***

Each *Isizinda* had a file containing an attendance register and the monitoring forms. After each GM session, the nutrition monitor summarised the attendance ratio. A roster for the GM sessions was compiled for each calendar year. Each *Isizinda* was provided with the necessary equipment which was locked away in a trunk that was kept at each household hosting the *Isizinda*. The mothers hosting the *Isizinda* took responsibility for (i) the equipment, (ii) weeding and watering the demonstration garden and (iii) reminding the mothers of the next GM session. The project activities were supervised at community level by the headmaster of the local school. A staff meeting was held every month.

### ***Training of the nutrition monitors***

The initial training of the nutrition monitors for the GM activities was done over a period of five days and equipped them with the skills to complete the register, take the anthropometric measurements and promote the importance of regular GM. Further in-service training, one day per month for 12 months, covered the following topics: growth of children, malnutrition, breastfeeding, complementary feeding, management of diarrhoea, safe food, and hygiene. During December of each year, a 2-3 day refresher training course was held focussing on problem areas identified by the nutrition monitors and observed by the project leader.

Each training session started with an overview of the content and the purpose of the training, and ended with a review of the day's activities. Only one topic was addressed per session. The training focussed on job orientation, problem-solving, technical ability and accuracy. Participatory techniques were encouraged and role-play formed an integral part of the training sessions. Technical aspects such as weighing and plotting the weight were continuously practised. The training programme was not rigid and allowed flexibility to address specific needs as they arose.

### ***Characteristics of the nutrition monitors***

At the time when they joined the project, they were mostly in their late twenties or early thirties. They had either Std 9 or Std 10. They were Zulu-speaking, and fluent in English. From the nine nutrition monitors who were trained, three were from the Ndunakazi village. Two of the four men and one of the five women were married. Only one of the five women did not have children. Although a total of nine nutrition monitors were trained to perform the GM activities, only two were allocated exclusively to the GM activities. The project did not give a true reflection of the number of nutrition monitors needed to run the project, as the *Isizinda* activities were not their only responsibilities. It is envisaged that, once all research activities are completed, the *Isizinda* project will eventually be run by only one nutrition monitor, who will be assisted by community volunteers.

### ***Monitoring the activities***

The activities of the project was monitored monthly by the project leader by (i) discussing the progress of the project and problems encountered, if any, with the nutrition monitors, (ii) reviewing the summary of the attendance at each *Isizinda* for the previous month, (iii) scrutinising the *Isizinda* files for completeness and accuracy, and (iv) attending at least one GM session. Problems identified were used to target the in-service training.

### ***Community meetings***

Community meetings were held at least twice a year to discuss the progress of the project. The MRC did not interfere with the decisions taken during these meetings.

## **8.2.4 Descriptive data of the children attending the *Isizinda***

### ***Characteristics of the children attending the Isizinda***

In total, 329 children attended the *Isizinda* form the start (1995) until the end (2000) of the study. Of the children, 47% were boys, 53% girls and 24% were born at home. The prevalence of low birth weight was 10%.

### ***Anthropometric status***

The data from 1995 to 2000 were pooled. The anthropometric indicators suggested that there was no seasonal effect on the nutritional status of the children. The distribution curve for

height-for-age was shifted towards the left indicating decreased linear growth. The children started with a high prevalence of overweight, according to the reference population (Hamill *et al.*, 1979), which decreased, and after the age of 2 years the prevalence of overweight was lower than 5%. Whereas clinic data is usually not representative of the population (Coetzee & Ferrinho, 1994), the data collected at the *Isizinda* were very similar to the anthropometric data collected during the situation assessment, indicating that the *Isizinda* data are representative of the community.

### ***Morbidity data***

For all children 5 years and younger, the percentage child contacts that were positive for diarrhoea decreased steadily each year from 8.0% in 1995 to 2.2% in 2000. The prevalence of diarrhoea was the highest in children aged 1-<2 years.

## **8.2.5 Acceptability of the *Isizinda* project**

### ***Coverage and attendance***

Whereas the coverage of children in the health facilities is generally low (Coetzee & Ferrinho, 1994; Schoeman *et al.*, 2000), coverage of children by the *Isizinda* project was estimated at approximately 90%, with at least 60% of these children being adequately covered. In contrast with clinic data which favours the younger child (Coetzee & Ferrinho, 1994; Schoeman *et al.*, 2000), the *Isizinda* data showed an equal distribution of child contacts over the various age categories for children younger than 5 years.

### ***Maternal attitude***

The Ndunakazi mothers were appreciative towards the *Isizinda* project because of a better understanding of the benefits of regular GM. They valued the knowledge aspects of the project, and expressed a sense of empowerment regarding the knowledge that they have gained. They were satisfied with the way it was managed. The community had a strong desire for the project to continue.

### ***Nutrition monitors' attitude***

The nutrition monitors had a positive attitude towards the project and viewed regular GM as

important.

### 8.2.6 Changes observed since the launch of the *Isizinda* project

Positive changes have been reported since the launch of the project.

- (i) One year after the launch of the project, most mothers could interpret the growth curve. Although no baseline data was available on maternal comprehension, it can be assumed that it was low. In a neighbouring village that has an extensive CHW programme and established health facilities, less than 30% of the mothers comprehended the growth curve (unpublished data).
- (ii) The average age for introducing solid foods in 1995 was  $2.8 \pm 0.8$  months (Faber *et al.*, 1997) versus  $3.6 \pm 0.8$  months in 1997 (Faber & Benadé, 1999).
- (iii) The *Isizinda* provided the infrastructure for promotion and served as training centres for the agricultural activities of a household food production project (Faber *et al.*, 2001b) that was established to address the vitamin A deficiency shown during the situation assessment (Oelofse *et al.*, 1999). The infrastructure of the community-based GM was the platform for the nutrition education which resulted in improved knowledge regarding vitamin A nutrition (Faber *et al.*, 2001b). Although there was a seasonal effect (Faber *et al.*, 2001c), the nutrition education and agricultural activities had a positive effect on vitamin A intake (Faber *et al.*, 2002) and ultimately vitamin A status (Faber *et al.*, in press) of the children.
- (iv) There was a steady decline in the prevalence of diarrhoea. Although this can probably be attributed, at least to some extent, to the nutrition education, the effect of the installation of taps during the latter half of the study cannot be measured because of the lack of a suitable control area.

## 8.3 CONCLUSION

The *Isizinda* project was a package of various activities which were based on the findings of the situation assessment, and is, therefore, an example of community-based actions that were established based on a participatory approach of problem assessment and analysis. By creating the opportunity for the mothers to have their children growth monitored regularly within the

community, the *Isizinda* addressed a specific need that was created by a lack of health facilities within the area. The high coverage and attendance ratio, equal distribution over the age-categories and representativeness of the *Isizinda* project suggest that community-based GM is a viable option to be used for screening and nutrition surveillance, and as platform for nutrition education. The *Isizinda* project showed that community-based GM can provide the infrastructure for developing capacity for agricultural activities within the community. Data from the household food production project showed that maternal knowledge regarding nutritional issues can be improved through nutrition education given at the GM sessions and that, when GM is integrated with agricultural activities, a significant improvement in child malnutrition can be obtained (Faber *et al.*, in press). The *Isizinda* project falls within the framework of the INP (*INP Strategy*, 1999), and can bridge the gap in areas which lack health facilities.

#### **8.4 RECOMMENDATIONS FOR FURTHER RESEARCH**

##### ***Develop a structured flow chart for counselling mothers***

At the *Isizinda*, the recorded morbidity data helped the nutrition monitors to interpret the growth curve and counsel the mothers when a sudden weight loss occurred. Although guidelines were available for counselling, the use of a structured flow chart, based on the concept of the diagnostic counselling and treatment cards for diarrhoea that are used in Indonesia (Sutisnaputra *et al.*, 1993), should be developed and tested.

##### ***Improve the referral system to the clinic***

Individual children who showed growth faltering or were in need of medical attention were referred to the clinic. Although the information system at the *Isizinda* allowed for clinic referrals to be recorded (in the "comments" column), this was seldom done. The information system should be redesigned to allow a more systematic recording of clinic referrals as this will help the nutrition monitors to follow-up the children.

##### ***Determine the viability of scales***

The Ndunakazi children were weighed on electronic scales. These scales are, however, not a viable option for community-based GM programmes as they are expensive, sensitive, fragile

and need a continuous supply of batteries. The DRS had been used in local studies (Kuhn & Zwarenstein, 1990; Coetzee & Ferrinho, 1994) and may be a more viable option, especially as the mothers can benefit from using the DRS (Meegan *et al.*, 1994; Meegan & Morley, 1999). An survey needs to be done to investigate the pros and cons of available scales to determine which scale is the most practical to be used for community-based GM.

#### ***Determine the feasibility, necessity and frequency of height measurements***

Although height measurements are recorded in some private clinics (Harrison *et al.*, 1998), most clinic-based GM programmes only include weight measurements. In South Africa, as was the case in Ndunakazi, the prevalence of stunting is higher than the prevalence of either underweight or wasting (South African Vitamin A Consultative Group, 1996; Labadarios *et al.*, 2001) and, as a result, the inclusion of height measurements in GM programmes has been suggested (Coetzee & Ferrinho, 1994; Labadarios *et al.*, 2001). Routine height measurements for GM have too low a sensitivity and specificity to be regarded as a screening tool (Hall, 2000), but can be used for nutrition surveillance. Height measurements are time-consuming and, as they are not plotted on the growth chart, *monthly* height measurements have little purpose. Six-monthly or annual measurements would probably be sufficient and more acceptable. The feasibility, necessity and frequency of height measurements in community-based GM programmes should be determined.

#### ***A structured training schedule and manual must be developed.***

It is envisaged that, should community-based GM activities be initiated in other rural villages in KwaZulu-Natal, the Ndunakazi nutrition monitors can act as trainers. This will make the training of nutrition monitors more realistic and task-orientated. It will enlarge the network of skilled people and it will enhance the impact, success and sustainability of community-based GM projects. For this to materialise, it is important that a structured training schedule, such as those used in Indonesia (Mantra *et al.*, 1993) and Tanzania (Jennings *et al.*, 1991), be formalised. In addition, a training manual should be developed, based on the Ndunakazi experience.

#### ***Effect on nutritional status***

A shortcoming of the *Isizinda* project was the lack of a suitable control group, making it

impossible to measure the effect of community-based GM *per se* on the nutritional status. The *Isizinda* project was acceptable to the Ndunakazi mothers and a high coverage and attendance ratio were achieved. The next step would be to evaluate the effect of community-based GM on the nutritional status of children through a cluster-randomised controlled trial. For this, at least 12 comparable villages should be selected and randomly allocated to either the experimental group or control group (Garner *et al.*, 2000). Pre and post measurements must be taken to measure the change in nutritional status (Levinson *et al.*, 1999).

# **Chapter 9**

## **REFERENCES**

## CHAPTER 9

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# **Appendix A**

## **Questionnaire**

**Households with children 0-11 years**

**Situation assessment in 1994**

**MEDICAL RESEARCH COUNCIL**

***NATIONAL RESEARCH PROGRAMME FOR NUTRITIONAL INTERVENTION***

**QUESTIONNAIRE 2**

**MOTHER OF CHILDREN 0-11 YEARS**

All the information is *confidential* and will only be used for research purposes.

*Copyright reserved*

*April 1994*

Card number

1

Y Y M M D D

Date today:

7

CHW code number:

Code number of mother:

12

a) With whom is this interview?

Who	Relation to child: specify	
Mother	X	1
Caretaker - foster mother	X	2
Caretaker - grandmother	X	3
Caretaker - own family		4
Caretaker - in-law family		5
Caretaker - unrelated		6
Other: specify		7
.....		
.....		

b) Which part of a day is the child/children 0-11 yrs in your care?

Morning only	1
Afternoon only	2
Night only	3
All day, but not in the night	4
24 hr per day	5
Other: specify: .....	6

c) [When you insert the university URL (http://scholar.sun.ac.za), please ask:]

For how long has this child/these children been in your care? (Specify)

.....  
 ..... months

				17
--	--	--	--	----

*If the interview is with the MOTHER complete Section A, B, C, D, E and F.  
 If the interview is with a CARETAKER complete Section B, D, E and F.*

SECTION A To be filled in for mother (not for caretaker)

1. Name and surname of mother: .....  
 .....  
 .....

2. Number of pregnancies: .....  
 3. Number of children: .....  
 4. a) How many of your children died before they were 5 years old (after live birth):.....

				22

b) How old was the child when it died? What was the cause of its death?

.....	.....
.....	.....
.....	.....

				31

5. Are you married?

Yes, only wife (Go to question 6)	1
Yes, more than one wife (Go to question 6)	2
No, unmarried (Go to question 8)	3
Separated/divorced (Go to question 8)	4
Common-law wife (Go to question 6)	5
Other: specify:.....	6

				32
--	--	--	--	----

6. Is your husband working away from home?

Yes, home every evening	1
Yes, home every week-end	2
Yes, home every month	3
Yes, home 2x/year	4
Yes, home 1x/year	5
Yes, home very seldom	6
No, he is working locally	7
Husband does not work	8
Not applicable/not married	9

33

7. What kind of work does your husband do? Please specify: .....

.....  
 .....

34

SECTION B To be filled in for mother/caretaker

8. Which standard did you pass at school?

No educational qualifications	1		
Sub A	2		
Sub B	3		
Std 1	4		
Std 2	5		
Std 3	6		
Std 4	7		
Std 5	8		
Std 6 Form I	9		
Std 7 Form II	10		
Std 8 or NTC I, Form III	11		
Std 9 or NTC II, Form IV	12		
Std 10 or NTC III, Form V	13		
Std 10 + 1 yr, NTC V	14		
Std 10 + 2 yrs, NTC V	15		
Std 10 + 3 yrs eg a degree	16		
Other: specify:.....	17		36

9. Which languages can you read?

Zulu	1		
English	2		
Cannot read	3		
Other: specify:.....	4		40

10. Do you have a cash income?

Yes, regular (Go to question 11)	1		
Yes, irregular (Go to question 11)	2		
No, no cash income (Go to question 12)	3		
Unsure (Go to question 12)	4		41

11. If yes, please specify where the cash money (isamba) comes from.

Own income	1	
Husband income	2	
Child support/maintenance from father of child	3	
Pension, grant. Please specify:..... .....	4	
Not applicable/no cash income	5	46

12. How many other people in this household have a regular cash income?

Who	Source
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
Unsure/nobody (code=0)	

Number of people 47

13. Do you regularly listen to the radio?

Yes	=1	
No	=2	48

14. What are the sources of food for you and your children?

Own garden	1	
Own livestock	2	
Bought	3	
Payment in kind	4	
Gifts	5	
Food Aid/Welfare/Non Governmental Organisations	6	
Borrow	7	
Beg	8	
Other: Specify:.....	9	57

15. Do you use water from

the river	1	
borehole	2	
both river and borehole	3	58

16. Do you boil the water used for drinking?

Yes	1	
No	2	
Sometimes	3	59

17. What kind of toilet do you use?

Pit toilet	1	
Veld/forest	2	
Other (specify:..... )	3	60

18. What foods and drinks are usually served to children 0-1 years of age in this household? Please specify everything.

Breakfast: .....  
.....  
.....  
.....

In-between: .....  
.....  
.....  
.....

Lunch: .....  
.....  
.....  
.....

In-between: .....  
.....  
.....  
.....

Supper: .....  
.....  
.....  
.....

After-supper: .....  
.....  
.....  
.....

19. What foods and drinks are usually served to children >1-2 years of age in this household? Please specify everything.

Breakfast: .....

.....

.....

.....

In-between: .....

.....

.....

.....

Lunch: .....

.....

.....

.....

In-between: .....

.....

.....

.....

Supper: .....

.....

.....

.....

After-supper: .....

.....

.....

.....

20. What foods and drinks are usually served to children >2-5 years of age in this household? Please specify everything.

Breakfast: .....  
.....  
.....  
.....

In-between: .....  
.....  
.....  
.....

Lunch: .....  
.....  
.....  
.....

In-between: .....  
.....  
.....  
.....

Supper: .....  
.....  
.....  
.....

After-supper: .....  
.....  
.....  
.....

21. What foods and drinks are usually served to school-children in this household? Please specify everything.

Breakfast: .....  
.....  
.....  
.....

In-between: .....  
.....  
.....  
.....

Lunch: .....  
.....  
.....  
.....

In-between: .....  
.....  
.....  
.....

Supper: .....  
.....  
.....  
.....

After-supper: .....  
.....  
.....  
.....

22. What luxuries (cance, such as cold drinks, chips, sweets, chocolates etc) do the children in your care eat regularly? Specify for each age group.

	Luxuries	Times/week
>1-2 yrs (Code=1)	..... ..... .....	..... ..... .....
>2-5 yrs (Code=2)	..... ..... .....	..... ..... .....
School- children (Code=3)	..... ..... .....	..... ..... .....

Card number

2	1
---	---

Code number of mother

				5
--	--	--	--	---

23. Who are served first, second, third, etc at meal times?

Elderly	1	
Adult males	2	
Adult females	3	
Teenager males	4	
Teenager females	5	
Bigger children (4-11 years)	6	
Small children (1-3 years)	7	
Everybody served together	8	21

24. Do the children eat together out of one plate/bowl?

Yes	1	
No, eat separately	2	
Other: specify:.....	3	22

25. Does this household usually have enough food for everybody?

Yes (Go to question 28)	1	
No (Go to question 26)	2	
Unsure (Go to question 26)	3	23

26. How often do some people go hungry?

more than 2 days in a week	1	24
one day per week	2	
seldom (not every week)	3	
never	4	

27. Who usually goes hungry? Please specify.

.....

.....

(Codes: Mother=1; Father=2; Elderly=3;  
Children 0-11 yrs=4; Any other family/people in the  
household=5, everybody/all of us=6).

28. What do you consider as the biggest health problem  
in your community

affecting children? .....	1	32
.....		
affecting pregnant women? .....	2	
.....		
affecting lactating women? .....	3	
.....		
affecting adults? .....	4	
.....		
affecting teenagers: .....	5	
.....		
affecting elderly: .....	6	
.....		
affecting everybody: .....	7	
.....		

29. What do you suggest the community can do about this?

.....

.....

.....

Fieldworker, does this mother have a child/children younger than one year? If **yes**, complete Section C and D for this child. If **not**, thank her for her cooperation. Please remember to weigh and measure all the children between 0 and 11 years.

If you interview a caretaker and she/he cares for a child younger than one year, complete Section D page 16 (but not Section C) with the caretaker.

	Card no	3	1
	Code number of mother		5
	Code number of child younger than one year		10
30. Where did you go for antenatal care (ukuxukuza) when you were pregnant with the child?			
No care	1		
Hospital: specify where .....	2		
Antenatal clinic: specify where .....	3		
Private doctor: specify where.....	4		
Traditional healer	5		
Birth attendant/midwife	6		
Other: specify:.....	7		17
31. Did you smoke tobacco when you were pregnant with this child?			
Yes (Go to question 32)	1		
No (Go to question 33)	2		
Unsure (Go to question 33)	3		18
32. If yes, how many cigarettes and/or pipes per day? Specify number.			
..... cigarettes	1		
..... pipes	2		24

33. How long after the birth was this youngest baby put to the breast?

Immediately (<½ hour)	1	
½ - 1 hour	2	
>1 hour	3	
Never put to the breast	4	
Unsure	5	25

34. Did you take any pills/tablets/medicine during this pregnancy?

Iron supplement	1	
Pills/tablets: specify what.....	2	
Medicine: specify what.....	3	
Other: specify.....	4	
No pills/tablets/medicine	5	
Unsure	6	31

35. Did you have an immunisation injection (against tetanus) during pregnancy?

Yes	1	
No	2	
Unsure	3	32

36. For how long did you breastfeed this baby?

Still breastfeeding (Go to question 38)	1	
..... months (Go to question 37)	2	
Did not breastfeed (Go to question 38)	3	
Unsure (Go to question 37)	4	35

37. Why did you stop breastfeeding? Please specify.

.....

.....

.....

.....

.....

36



SECTION D To be filled in with mother/caretaker for a child younger than one year.

42. How many times has the child had diarrhoea/gastro/running tummy?

Never (Go to question 48)	1	
Once	2	
Two times	3	
More than two times	4	
Unsure	5	49

43. How was the child treated for the diarrhoea during the last episode? (You can tick more than one, if necessary)

Not treated at all	1	
Treated with home-made oral rehydration therapy	2	
Treated with other home remedy, specify what.. .....	3	
Treated with bought/packet oral rehydration therapy	4	
Other treatment: specify: .....	5	
Unsure	6	55

44. Did you stop giving the milk feed while the child had diarrhoea?

Yes	1	
No	2	
Do not know	3	56

45. Did you stop giving solid foods while the child had diarrhoea?

Yes	1	
No	2	
Child was not receiving solid foods yet	3	
Do not know	4	57

46. Who suggested this treatment?

Own knowledge/experience	1	
Family advice. Specify whose: .....	2	
.....		
Consulted help. Specify who: .....	3	
.....		

58

47. If a home-made oral rehydration therapy was used by this mother/caretaker (question 42), please give the recipe here:

.....  
 .....  
 .....

59

48. Name all the diseases/illnesses this baby has suffered since birth.

Tuberculosis	1	
Skin rashes	2	
Worms	3	
Upper respiratory infections	4	
Measles	5	
Other contagious diseases (eg whooping cough, chicken pox) .....	6	
Bilharzia .....	7	
Other: Specify .....	8	
.....		

67

49. Have you ever taken this baby to a clinic?

Yes	=1	
No	=2	
Unsure	=3	

68

50. Why did you take the child to a clinic?  
Please specify.

.....  
.....  
.....

	69
--	----

51. Has the baby been weighed there?

Yes	=1		
No	=2		
Unsure	=3		

52. Has the length of the baby been measured there?

Yes	=1		
No	=2		
Unsure	=3		

53. Does this child have a growth chart (If yes, please ask to see the chart)

Yes	=1		
No	=2		
Unsure	=3		

Card no.

4	1
---	---

Code number of mother

				5
--	--	--	--	---

54. Copy from the growth charts the dates on which the child was immunised at a clinic.

Age	Immunisation	Date administered					
		Y	Y	M	M	D	D
New born	B.C.G.						
	Polio drops						
3 months	Polio, D.P.T.						
	B.C.G.						
4½ months	Polio, D.P.T.						
6 months	Polio, D.P.T.						
	Measles						
9-10 mths	Measles						

47

55. When last was the baby taken to a clinic. Specify date: .....

Y	Y	M	M	D	D

53

56. Do you think your child is growing well?

Yes	=1
No	=2
Unsure	=3

54

57. Why do you say so? .....  
 .....  
 .....  
 .....

--

55

Thank the mother/caretaker for her cooperation.

Go on to section E and F for measurements.





# **Appendix B**

**Open-ended semi-structured interviews**

**Situation assessment in 1994**

## QUESTIONS FOR THE COMMUNITY LEADERS

### Changes in the community within the last 10 to 15 years

- Agriculture
  - What has changed in the agriculture production in the last 10-15 years? Why?
  - What are the main crops produced by families today, and in former times?
  - What are the main livestock produced by families today, and in former times?
  - Who works mainly in the fields today and in former years (men/women)?
  - Do you use fertilizer and/or pesticides?
  - Is there any government assistance for agricultural activities?
  - Is there any credit system? If yes, what kind of credit system?
  - Is it easier/more difficult to obtain credit than in the past?
- Water supply
  - What is the main source of water in the community?
  - Is there any time during the year that you experience water shortage? When?
  - Was it always like this or has the situation improved or worsened? Why?
- Infrastructure
  - Have there been major changes in the roads leading into the community? What changes?
  - Have there been major changes in the construction of buildings? What changes?
  - Have there been major changes in services, e.g. electricity, transport, health service, shopping facilities, etc.? What changes?
- Income
  - What is the main source of income of families today and in former years?
- Migration and employment
  - Do people migrate or look for work outside the community? Is it different from the past?
  - Where and for whom do men mainly work today and in former years?
  - Where and for whom do women mainly work today and in former years?
  - Are more people unemployed today than in former times? Why?
- Family structure
  - Are families larger, smaller or the same size in comparison to former times?
  - Are there more teenage pregnancies (11-15 years) today than in former times?
- Role of women in the community
  - Is the role of women in the community different today than in former times? Specify.
  - Are women involved in more leadership positions than in former times?
- Community structure
  - Is the way in which the community is organised different today as in the past? How?
  - Is the way the community is organised more efficient now than in former times? Why?
- Living conditions
  - Did living conditions change in the last 10-15 years? Why did they change?
  - Is it better or worse now? Why?

### Main perceived problems

- What are the main problems in your community?
  - What are the reasons for these problems?
  - Which of these problems need to be addressed first? Rank the problems from the most important to the least important.
  - How do you suggest can these problems can be overcome?

### Organisations involved in the community

- What organisations are involved in the community?
- List these organisations from the most to the least important in your community.

## QUESTIONS FOR HEALTH WORKER IN THE MOBILE CLINIC

- What do you think are the main problems of families in the Ndunakazi community?
  - How do you think these problems can be overcome?
- Who (and how many) people, for example nurses/health workers, are going with to the community when the mobile clinic goes to the Ndunakazi area?
- Does a doctor ever go out with the mobile clinic? If yes, how often?
- Must the people pay to attend the mobile clinic? If yes, who and how much?
- How often does the mobile clinic go to the Ndunakazi area?
- How do the people know that the mobile clinic is coming to their area?
- At how many different locations/spots in the Ndunakazi area does the mobile clinic stop on the day that it goes there?
- How long does it usually take the people in Ndunakazi to come to the mobile clinic?
- How many people of Ndunakazi come to the mobile clinic on the day that it goes there?
- Is there any time during the year that more people in Ndunakazi come to the mobile clinic than other times of the year? When and why?
- What are the main reasons why people in the Ndunakazi area come to the mobile clinic?
- Health situation of children under 5 years in the Ndunakazi area
  - What are the main illnesses of children under five in the Ndunakazi area?
  - Ask for each illness
    - What does the mother/caretaker usually do when the child has .....
    - What treatment does a child get when he is brought to the mobile clinic with .....
  - What is the main cause of death in children under 5 in the Ndunakazi area?
  - What is the prevalence of malnutrition/undernutrition in the Ndunakazi area (children under 5, other)?
- Which of the following services are given at the clinic
  - immunization
  - growth monitoring / weighing
  - antenatal care
  - family planning / child spacing
  - other (specify)
- What education is given to people visiting the mobile clinic? How often? How and when?
- What medicines are available at the mobile clinic?
  - How are these medicines supplied to the mobile clinic (eg by request according to need or standard delivery/packages)?
  - What medicines are used most often?
  - Must the people pay for these medicines? If yes, at normal or reduced price?
- Are ORS packages available at the mobile clinic? If yes, do the people use them? If not, what else is available for children with diarrhoea?
- Is formula milk available at the mobile clinic? If yes, what brand names and at what cost? (free/reduced price/normal price)
- Why do you think that the people of the Ndunakazi area do not come to the mobile clinic?
- What role does the traditional midwives/birth attenders have in the Ndunakazi community?
- What cooperation is there between the staff of the mobile clinic and the traditional midwives/birth attenders of Ndunakazi?
- What cooperation is there between the staff of the mobil clinic and the traditional healers/faith healers/herbalists of Ndunakazi?
- What is your opinion about the service that the mobile clinic provides to the community?
- What are the main problems to run the mobile clinic?

## QUESTIONS FOR TRADITIONAL HEALER

- What do you think are the main problems of families in the Ndunakazi community?
  - How do think these problems can be overcome?
- How many traditional healers, faith healers and herbalists are there in the Ndunakazi community?
- Must the people pay for the service that they get from the traditional healers? If yes, how much?
- How long (in time) does it usually take the people in Ndunakazi to get to you?
- How many people of Ndunakazi come to you to be healed per week?
- Is there any time during the year that more people come to be healed than other times of the year? When and why (for what)?
- What are the main health problems of the people who come to you?
- Health situation of children in Ndunakazi under 5 years
  - What are the main illnesses of children under five in the Ndunakazi area?
  - Ask for each illness
    - What does the mother/caretaker usually do when the child has .....?
    - How long do they wait when the child has ..... before they bring him/her to you?
    - What treatment do you give a child when he is brought to you with .....
  - What is the main cause of death in children under 5 in the Ndunakazi area?
  - What is the prevalence of malnutrition/undernutrition in the Ndunakazi area (children under 5, other)?
- What "medicines" are available from traditional healers and what are they made of (eg plants, oils, herbs, etc.)?
  - What "medicines" are used most often?
  - Must the people pay for these "medicines"?
- What is the traditional healer's viewpoint: how soon after birth should the baby be put on the mother's breast? Why?
- What is the traditional healer's viewpoint: up to what age should a baby get ONLY breastmilk (no other food or fluids)?
- What role do the traditional healers have in the Ndunakazi community?
- What cooperation is there between the traditional healers and the clinic staff?
- What is your opinion about the service that the traditional healers provide to the community?
- What are the main problems that traditional healers have in providing a service to the community?
- Would you be prepared to work together with other health personnel to manage Ndunakazi's health problems?

## QUESTIONS FOR TRADITIONAL MIDWIFE

- What do you think are the main problems of families in the Ndunakazi community?
  - How do you think these problems can be overcome?
- How many traditional midwives/birth attenders are there in the Ndunakazi community?
- Must the people pay for the service that they get from the traditional midwife/birth attenders? If yes, how much?
- How long (in time) does it usually take you to go to the people when a baby is born?
- How many births do you attend per week/month/year in Ndunakazi?
- Why do you think do some mothers prefer to deliver their babies at home rather than at the hospital?
- Health situation of children in Ndunakazi under 5 years
  - What are the main illnesses of children under five in the Ndunakazi area?
  - For each illness
    - What does the mother/caretaker usually do when the child has .....
  - What is the main cause of death in children under 5 in the Ndunakazi area?
    - What are the reasons for this?
  - What is the prevalence of malnutrition/undernutrition in the Ndunakazi area?
- What role does the traditional midwives/birth attenders have in the Ndunakazi community?
- What cooperation is there between the traditional midwives/birth attenders of Ndunakazi and the clinic/mobile clinic staff?
- What is the traditional midwife/birth attender's viewpoint: how soon after birth should the baby be put on the mother's breast? Why?
- What is the traditional midwife/birth attender's viewpoint: up to what age should a baby get ONLY breast milk (no other food or fluids)?
- What cooperation is there between the traditional midwives/birth attenders and the traditional healers/faith healers/herbalists?
- What is your opinion about the service that the traditional midwives/birth attenders provides to the community?
- What are the main problems that traditional midwives/birth attenders have in providing a service to the community?
- Would you be prepared to work together with other health personnel to manage Ndunakazi's health problems?

## QUESTIONS FOR SHOP OWNER

- What do you think are the main problems of families in the Ndunakazi community?
  - How do you think these problems can be overcome?
- What is the distance that people must walk to get to your shop - in time?
- What are the main foods that people buy from your shop?
- How often are the following perishable foods delivered to your shop
  - meat/fish/chicken
  - milk
  - cheese
  - vegetables
  - fruit
- How are the following perishable foods stored in your shop
  - meat/fish/chicken
  - milk
  - cheese
  - vegetables
  - fruit
- What are the food price fluctuations over a year? Specify foods.
- What credit system is available with which people can buy food from your shop?
- Which brands of baby milk do you sell in your shop?
  - Which of these baby milks do the people buy the most?
- What baby foods do you sell in your shop?
  - Which of these baby foods do the people buy the most?
- Which medicines do you sell in your shop?
  - How do you know what medicine to sell for a specific complaint?
  - How do the people know how to take the medicine?
  - If he tells them, where did he get the knowledge?
- What do you recommend for
  - diarrhoea
  - fever/running temperature
  - sores
- How much salt do you sell per month?
  - How much of the salt that you sell is iodized (green packet) or not iodized (blue packet)?
  - What percentage of families buy salt from your shop?

# **Appendix C**

**Focus group discussions**

**Situation assessment in 1994**

## MOTHERS

### *Perceived main problems*

- What are the main problems of families in your community?

### *Health situation of children under 5 years*

- Do you think your child is healthy?
- What are the main illnesses?
  - For each illness:
    - How do you know your child has .....
    - Why do you think your child gets .....
    - What do you do when your child has .....
    - Why do you give this treatment for .....
    - Where did you get the information to do so when he has .....
    - To whom do you take your child when it has .....? Why?
    - How long do you wait before you take your child there when it has .....

## WOMEN'S LEAGUE

### *Perceived main problems*

- What are the main problems of families in your community?

### *Water*

- Do you have any water shortage during the year, when (months)?
- Where do you get your water from?
- How much time do you spend fetching water per day?
- Do you use your water as it is?
- How can water supply be improved?
- Which resources will be needed? (in general, contribution of communities) / Which resources do you know can help you get water?

### *Organisations involved in the community*

- What organisations work in the community?
- Which governmental departments / organisations contribute towards:  
(What has the government done for the community?)
  - Education
  - Agriculture
  - Health
  - Water
  - Electricity
  - Transport
  - Telephone
- What is done by the community to improve itself?
- Are there any people from outside who are helping the community?
- Suggestions how to improve the way these organisations work in the community.
- What can the community do to make these organisations work better?
- Which other organisations should work in the community?

# **Appendix D**

**Information sheet**

**for**

**Monthly data collection at the *Isizinda***

# Ndunakazi Rural Primary Health Care

## PRESCHOOL GROWTH MONITORING PROJECT

Child's name and surname:..... Sex: *Boy / Girl* Child's code:.....

Mother's name and surname:..... Mother's date of birth: .....

Child's date of birth:..... Birth weight:..... Home delivery: *Yes / No*

Child sequence: 1 2 3 4 5 6 7 8 9 10 11 12 (encircle number)

Mother's height:..... Mother's weight: .....

	Date	Weight	Height	Remarks
Jan				
Feb				
March				
April				
May				
June				
July				
Aug				
Sep				
Oct				
Nov				
Dec				

Immunization	
At birth	BCG, Polio
6 weeks	Polio, DPT, Hepatitis B
10 weeks	Polio, DPT, Hepatitis B
14 weeks	Polio, DPT, Hepatitis B
9 months	Measles
18 months	Polio, DPT, Measles
5 years	Polio, DT

IN CASE OF DEATH: Date on which the child passed away:.....

Precise and full description of the cause of death: .....

.....







# **Appendix E**

**Focus group discussions**

**Maternal attitude**

**2001**

Questions used in the focus groups

1. Feelings about the project  
What have you learned from this project?  
What do you like in this project?  
How do you feel about the way it is run? Please explain  
Probe for.....gardens  
Probe for.....
2. Health improvement  
What are the health problems of children in this area?  
Has the Isizinda made a contribution towards improving these problems? - Explain  
Probe for....impact of gardens  
Probe for..... impact of monitoring of children's growth and weight
3. How sustainable is the project  
Do all areas have the Isizinda project? If no, would you like other areas to have this project? (How and Why)  
What are your feelings about the continuation of this project? How can this be done?

# **Appendix F**

## **Questionnaire**

### **Nutrition monitors' attitude**

**2000**

**Ndunakazi Community Nutrition Projects  
In collaboration with the MRC**

Nutrition monitor: \_\_\_\_\_ Today's date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_

1. How do you feel about the Ndunakazi Isizinda project?

.....  
.....  
.....

2. What do you think are the positive aspects (good things) of the Isizinda?

.....  
.....  
.....

3. What do you think are the negative aspects (bad things) of the Isizinda?

.....  
.....  
.....

4. What would you like to change at the Isizinda?

.....  
.....  
.....

5. What activities must happen at the Isizinda?

.....  
.....  
.....

6. Why it is important that as many as possible mothers attend the Isizinda?

.....  
.....

7. How do you think the Isizinda can be improved?

.....  
 .....

8. In which of the following activities would you like to receive more training (write either yes or no next to each option):

- taking a child's weight .....
- taking a child's height (while lying down) .....
- taking a child's height (while standing) .....
- taking a child's mid arm circumference (MUAC)..... ..
- completing the growth chart.....
- completing questionnaires.....
- conducting interviews.....
- giving education lessons to the mothers.....

9. Are you confident that at this stage you can perform the following activities accurately (please make a cross in the most appropriate block for each option)

taking a child's weight	<b>YES</b> <i>without supervision</i>	<b>YES</b> <i>but with regular supervision</i>	<b>NO</b> <i>needs further training</i>
taking a child's height (lying down)	<b>YES</b> <i>without supervision</i>	<b>YES</b> <i>but with regular supervision</i>	<b>NO</b> <i>needs further training</i>
taking a child's height (standing)	<b>YES</b> <i>without supervision</i>	<b>YES</b> <i>but with regular supervision</i>	<b>NO</b> <i>needs further training</i>
taking a child's MUAC	<b>YES</b> <i>without supervision</i>	<b>YES</b> <i>but with regular supervision</i>	<b>NO</b> <i>needs further training</i>
completing the growth chart	<b>YES</b> <i>without supervision</i>	<b>YES</b> <i>but with regular supervision</i>	<b>NO</b> <i>needs further training</i>
filling in questionnaires	<b>YES</b> <i>without supervision</i>	<b>YES</b> <i>but with regular supervision</i>	<b>NO</b> <i>needs further training</i>
interview people	<b>YES</b> <i>without supervision</i>	<b>YES</b> <i>but with regular supervision</i>	<b>NO</b> <i>needs further training</i>
give education lessons to mothers	<b>YES</b> <i>without supervision</i>	<b>YES</b> <i>but with regular supervision</i>	<b>NO</b> <i>needs further training</i>