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AN EVALUATION OF ASPECTS OF THE PEM (PROTEIN ENERGY MALNUTRITION) SCHEME FOR MALNOURISHED CHILDREN IN GAUTENG PROVINCE

Carol Anne Marshall

A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, in fulfillment of the requirements for the degree of Master of Medicine (Community Health)

Johannesburg, 1998

DECLARATION

I, Carol Anne Marshall, declare that this research report is my own work. It is being submitted for the degree of Master of Medicine in the branch of Community Health in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

C Marshall

31st day of March, 1998.

Ethics clearance certificate
Protocol No M 950 435

DEDICATION

To my husband and sons
without whose support this would never have got done

PUBLICATIONS AND PRESENTATIONSS ARISING FROM THIS STUDY

Marshall,CA. An evaluation of aspects of the PEM scheme for malnourished children in Gauteng Province, 1995. S Afr J Food Sci Nutr 1996; 8(2): suppl, 11

ABSTRACT

This study assessed aspects of targeting of the PEM scheme in Gauteng province. This food supplementation scheme targets beneficiaries including children 0-6 years, using largely anthropometric criteria. Routine provincial intervention data was analysed and related to available data on expenditure, population and indices of socio-economic need. Only 28% were children in the critical 7-36 month age group; and coverage was very low, with no correlation between indices of need and programme implementation by area. An exit interview to a sample of caretakers of 0-6 year old children in four clinics (two Local Authority, two provincial) examined the process of identification of beneficiaries. Low attendance by children over 1 year and 40% errors in growth monitoring, more frequent among sick children, effectively reduced screening coverage among the most at-risk. Health worker misclassification resulted in an 81% exclusion error among those meeting entry criteria, while 4% of the total were wrongly enrolled. Advice and nutrition promotion to caregivers was inadequate. Recommendations include service re-organisation, community-based initiatives and better monitoring.

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1 INTRODUCTION : THE PROBLEM OF CHILDHOOD MALNUTRITION

As affirmed by 160 Heads of State at the International Conference on Nutrition, held in Rome in 1991, the "nutritional well being of all is widely recognised as both a precondition and a key objective of progress in human and social development" (1). However, the level of protein energy malnutrition (PEM) in South Africa remains unacceptably high for a middle income country and has been called a "national embarrassment, given the country's resources, infrastructure and know-how" (2). This study examines a governmental food supplementation programme set up to address this problem from the point of view of the identification and targeting of beneficiaries.

While "nutrition" in the past has been used to describe an input (the consumption of food), using the concept of nutrition as reflecting an outcome of various factors and processes highlights that multiple factors need to be considered (3). As the solution to any problem must start with identification of that problem, this Introduction examines firstly the available data on nutrition status of pre-school children on South Africa. It then looks at a framework for understanding the determinants of childhood malnutrition and information on these determinants internationally and in South Africa. On the basis of this, international and local experience of interventions designed to address the problem are analysed. Lastly, a brief overview is given of governmental nutrition programmes in operation at the time of the study.

1.1 THE SITUATION IN SOUTH AFRICA

While there is as yet no national surveillance system in place, the results of three recent large-scale studies provide us with information regarding the situation in South Africa. The Project for Statistics on Living Standards and Development (PSLSD,1994) the School Entrant Survey (Department of Health,

1994) and the National Vitamin A Survey (SAVCG, 1995) are complemented by more detailed small scale and local studies.

Growth, as measured by anthropometry, is the nutrition outcome measure most commonly used to assess the nutritional status of children (3). Standardised definitions of anthropometric measurements and indices have been recommended by an expert committee of the World Health Organisation (4). These are stratified by age or other variables as indicators to evaluate the nutritional status of different groups, and can both guide interventions and evaluate their impact.

The measures covered in this introduction are weight and height, although other measures such as body-mass index are also used. The indices mentioned are weight-for-age, weight-for-height and height-for-age. Although these indices can be expressed in several different ways, this study uses the percentile, which is the rank position of an individual on a given reference distribution stated in terms of what percentage of the group is equalled or exceeded by the individual. Nationally, the growth charts in use the NCHS (National Centre for Health Statistics) as the standard, with a cut-off point for malnutrition at the 3rd percentile. This is in effect very close to other measures of malnutrition (-2 Z scores, 80% of the median weight for age) (5).

Low weight-for-age or underweight is recognised as a good predictor of mortality risk (6,7) and is not markedly susceptible to the effects of short term illness. Low weight-for-height (wasting) reflects acute nutritional stress and severe food shortages or serious illness (6).

Growth as a process rather than an achieved status is measured by change in weight over time. Terms such as "adequate growth" or "growth faltering" are commonly used but poorly defined. Growth monitoring, or regular weighing to track changes over time, records the loss of weight or failure to gain weight over a specified period of time as "faltering", although sometimes the failure to

gain a specified amount within a given time is used (8). Change in weight is more sensitive to current nutritional conditions than a single point-in-time measurement of weight-for-age (5).

Low height-for-age is indicative of stunting, which is the result of chronic long-term dietary inadequacy or illness or both (a). As shown in many studies internationally, in developing countries faltering of growth generally starts at about 6 months of age and the greater part of the deficit is already present by the age of 2 years. The extent to which this height deficit is ever made good appears to be very limited (8).

Although severe forms of malnutrition such as kwashiorkor and marasmus are no longer notifiable in South Africa , severe malnutrition (marasmus, marasmic kwashiorkor and kwashiorkor) constituted 11.4% of admissions to Chris Hani Baragwanath Hospital in 1996 (9). Acute malnutrition or wasting (weight for height less than 2SD) was found in 2,5% of the 0-6 year age group nationally (10). It is therefore not a significant public health problem in South Africa.

However, the prevalence of chronic malnutrition as reflected in the rate of stunting (height for age less than 2 SD) is a significant problem in several provinces, and national rates of 23%(10)) to 27%(11)) are high for a middle income country (12). Among the poorest quintile of households, the rate is 38%, whereas among the richest quintile it is only 6% (11,13). In Gauteng, the rate of 11.5% is considered low for a developing country by international standards (4,8).

The prevalence of underweight was shown to be 9,3% nationally and 5.8% in Gauteng (10), although here as in other measures, marked variations between provinces are noted, some of which may be expected to be reflected as well within provinces. However, in certain groups it is certainly higher than this, as shown by the admission data for Chris Hani Baragwanath Hospital in 1996, where 5% of admissions are found to be underweight (9).

The School Entrants Survey does reflect rates of malnutrition in primary school entrants that are considerably lower than the rates for pre-school children, although methodological issues may be the cause (12). This is borne out by a meta-analysis of small, localised studies of school children, which also point towards higher prevalences (5).

While specific reasons may exist for some of the variations seen, the range in reported prevalence of measures of undernutrition among the provinces and among the different studies, especially the local studies, is very wide. This suggests that the aggregated figures mask the variability in the determinants and the outcomes under study, and that "malnutrition is a problem in specific areas and among specific groups of children" (12). A review of the literature in South Africa concluded that the "... wide range of (rates of) undernutrition, indicate that that there are pockets or areas which have a very serious problem of malnutrition. This is an extremely important finding, because it indicates that intervention programmes will probably have to be different in different areas" (5).

Low birth weight (LBW) reflects both foetal growth and maternal well being, and is a marker for increased childhood mortality and morbidity risk (12). While no national figures are available, institutional data from micro-studies of health records indicate a rate of between 14 and 24% of live births, (14) and is particularly high among the "Coloured" communities of the Western Cape. This rate is high when compared to other middle income countries such as Malaysia (10%) and Brazil (11%) and indicates the LBW may be a significant public health problem (12,15).

1.2 THE IMPACT OF MILD-TO-MODERATE MALNUTRITION

The term malnutrition is commonly associated with deficits in energy and protein intake (the so-called PEM or Protein Energy Malnutrition). However, nutrient deficits are frequently multiple, with other micronutrients such as

vitamins and minerals also affected. The most critical of these have been identified as iodine, iron, Vitamin A and possibly zinc (1,16,17).

The impact of severe malnutrition on childhood mortality has long been recognised. However, recent work on mild-to-moderate malnutrition has indicated that over half of the 12.9 million deaths in children in developing countries are attributable either directly or indirectly to malnutrition (16,18). Below three years of age, an increased short-term risk for mortality is clearly documented for all anthropometric indicators. While the risk of death does increase with the severity of malnutrition, this relationship does not exhibit a clear cut-off level or threshold. The majority of deaths will therefore occur amongst the much larger group of mildly or moderately malnourished children (18). Above three years of age, risk is only increased in cases of severe growth retardation (8).

Apart from the mortality risk, the role of chronic or repeated infection as both a causal factor and outcome of malnutrition is well-recognised (19). There has been extensive work done on the magnitude, direction and mechanisms of this relationship as well as the impact of the "child survival" interventions on the nutritional status of children (12,19,20).

In the medium to long term, there is a demonstrable reduction in physical work capacity in stunted adults, although the functional significance of this in terms of productivity is less clear and varies according to the job. Reproductive competence is compromised in stunted adult women, in terms of a higher incidence of low birth weight and of obstructed labour (8).

An inverse relationship with cognitive development and intellectual capacity in adults has also been documented (16,21). Clear evidence of the effects of even mild-to-moderate malnutrition on the cognitive development of children and on the productivity and potential of adults have been shown by recent research(22). There is evidence that specific micronutrients are involved in

physiological cognitive processes (17), and that energy deficits result in a reduction in exploratory behaviour and initiative in early childhood (23). However, the outcome seems to be far more influenced by the co-existence of critical factors, associated with poverty and deprivation, as determinants of both stunting and cognitive development, such as parental education and attitudes and the psycho-social environment (8,16).

Given the high world-wide prevalence of stunting, the relative lack of research-based information on its functional impact is a major weakness, with controversy still apparent in relation to whether there are demonstrable ill-effects, or whether growth retardation is an effective adaptation rather than a pathological state. It would appear that, while stunting is not itself responsible directly for poor intellectual development in children, the process whereby children become stunted manifests many factors which affect both growth and cognitive development (8,24). This argument would therefore point to the identification of the faltering in growth which leads to stunting being viewed as a risk marker for these critically important factors in order to guide preventive actions. The early detection of mild and moderate malnutrition and the implementation of measures to correct the growth deficit can therefore be expected to have far-reaching benefits for the wellbeing of children (16).

1.3 DETERMINANTS OF POOR NUTRITION IN CHILDREN

"Malnutrition is not a simple problem with a single, simple solution. Multiple and interrelated determinants are involved in why malnutrition develops, and a similarly intricate series of approaches, multifaceted and multisectoral, are needed to deal with it" [64].

An understanding of the problem of children malnutrition must be based on an understanding of the complexity of the web of causality. Nutritional status is an outcome of many interrelated processes rather than a list of foods, or a service to be rendered (25). Undernutrition is closely linked to underdevelopment and

poverty, and yet it is necessary to identify the specific mechanisms whereby poverty impacts on nutritional status. This is particularly important in the case of young children, with their particular vulnerability to undernutrition. While economic growth and the alleviation of poverty provide an opportunity for improving nutritional status, this is not an automatic corollary. It is also a very long-term solution. However, current thinking in nutrition emphasises that there are interventions that can have an impact in the short and medium term, through identifying and addressing the specific factors affecting vulnerable groups in specific communities (3).

Many different frameworks have been developed to aid in conceptualising the causes and possible solutions to this problem. The framework used here and reproduced as Figure 1.1 was first used during fieldwork in Tanzania, and further developed as part of the UNICEF Nutrition Strategy. It classifies the causes of malnutrition as immediate (operating at the level of the individual), underlying (operating at the level of the family or household) and basic (operating at the level of society). The causes are recognised as multisectoral and embrace fundamentally food, health and caring practices. This framework has been used from local up to national levels to assess and analyse the problem in a particular context and to plan an appropriate mixture of actions to improve nutrition (16).

Using this framework and approach, the focus will be on the underlying family or household level factors, grouped into three problem areas, namely inadequate household food security, factors associated with health and basic services and factors relating caring practices.

The synergistic inter-relationship between infection and malnutrition has been called the "malnutrition-infection complex" (19). It is a major contributory factor in the vicious cycle of poor dietary intake leading to weight loss or growth failure with lowered immunity and a consequent increase in the frequency, severity and duration of infection and disease. This in turn both increases

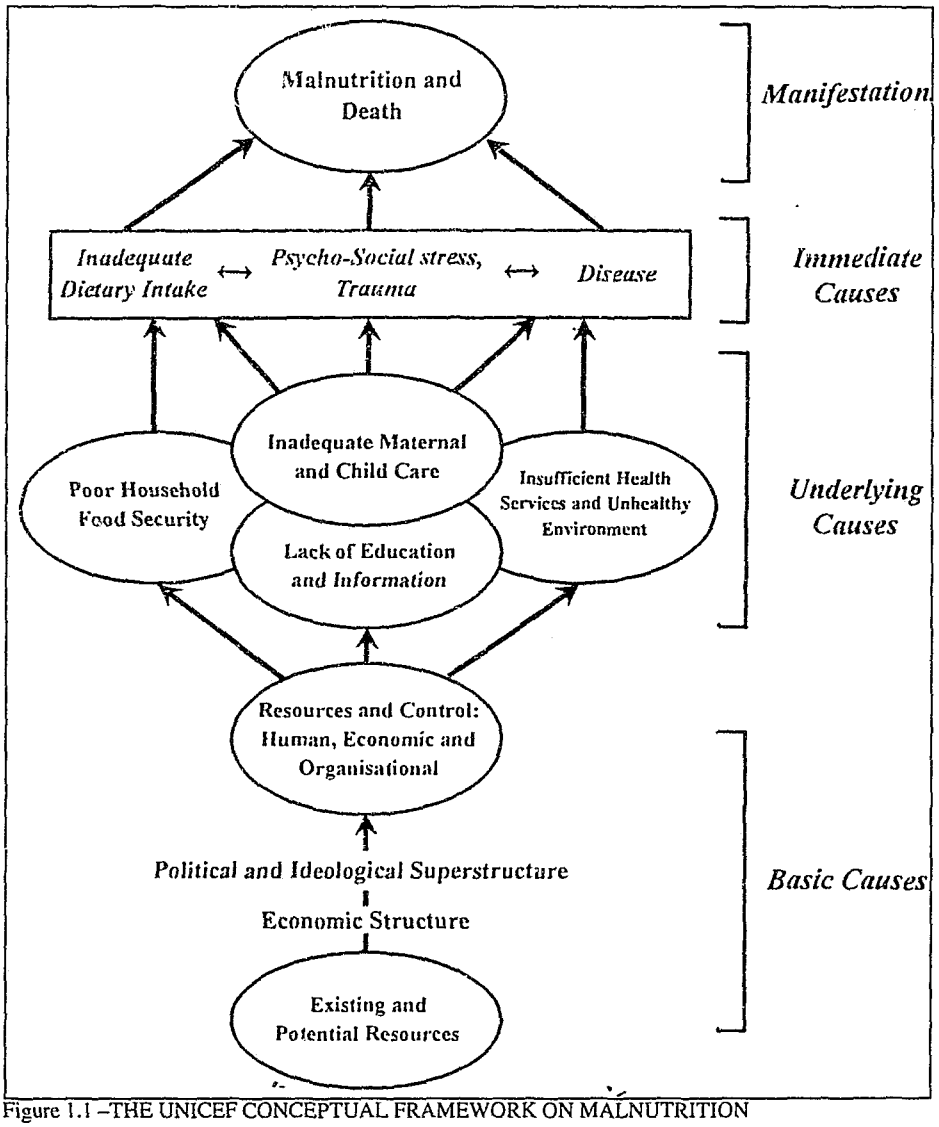


Figure 1.1 –THE UNICEF CONCEPTUAL FRAMEWORK ON MALNUTRITION

nutrient requirements at the same time as it reduces effective intake through decreased appetite and increased loss (for example through diarrhoea). The impact on the growth of young children of frequent or persistent episodes of diarrhoea, of repeated acute respiratory infections and of measles is seen to be a major factor in both growth faltering and as a precipitating factor in severe malnutrition (19,20). Inadequate access to water and sanitation, even in urban areas, plays a significant role in the stunting so common in pre-school children (26). A history of diarrhoea was found in 25% of children from an informal

settlement in South Africa on a recall study covering a two-week period (27). High rates of parasitic infestation in pre-school children have been shown in several local studies (5) and may influence growth through impairing intake and intestinal nutrient absorption.

Household food security refers to the ability of a household and its members to acquire sufficient food to meet the nutritional needs of all its members on an ongoing basis (3). Production, exchange or purchase of food are amongst the strategies that households can adopt to ensure food security. Vulnerability to household food insecurity arises when a household is obliged to use a significant proportion of its total resources to meet its food needs, and may result from a lack of production or from inadequate purchasing power (3,12).

In South Africa, it is estimated that 39% of the adult population do not achieve an intake of 2000kcal/day, the minimum daily requirement for energy (11). The impact of food insecurity on the nutritional status of children has also been demonstrated. Where expenditure on food made up 60% or more of the household budget, (a high proportion indicating vulnerability to food insecurity), 34% of children were found to be stunted, as opposed to 23% in households where food share was less than 60% of budget (11).

The subjective perception of hunger has been shown to be closely associated with poverty, with 88% of households reporting frequent hunger shown to fall below the Minimum Living Level (28). If this is used as an indicator of the health impact of poverty, 38% of African households are seen to be vulnerable, in contrast to 29% of Coloured households, 3% of White households and 2% of Asian households. Based on the above, estimates of the numbers of South Africans vulnerable to food insecurity range from 11 to 17 million (12) out of a total population of 37,8 million.

Recent policy developments question the assumption that the solution to this problem lies solely in the provision of food to the poor and an earlier focus on

food-based interventions as a response to the problem of hunger and malnutrition has been increasingly refined (3,25,29). Ensuring the adequate allocation of food to individuals within households, especially to vulnerable individuals such as children and women, requires attention to more complex issues of status, empowerment and attitudes and to the "bargaining" for allocation of resources that is part of the way families function. Moreover, it is increasingly being recognised that the economic and social status of women may be the pivotal link between household food security and the adequate health and nutritional status of its individual members {29,77,64}.

Thus the third cluster of contributing factors in the framework, that of "care", becomes a crucial one in the prevention of undernutrition, where the role of women as carers of children and their own empowerment and recognition within society begin to be seen together (3).

Research emanating from the social sciences and from developmental psychology is improving our understanding of just what is involved in this complex area. It is clear that care for children forms part of a complex system of inter-personal relationships within the household and the specific physical and social context. Such essential activities as the preparation and giving of food; the provision of love, stimulation, support and shelter; the protection of the child from environmental hazards such as contaminated food or water; and the use of modern skills and technologies during illness are all of critical importance (16,23). The education, status, health and mental wellbeing of the primary caregiver (usually the mother) are obviously of critical importance in determining how well she is able or willing to fulfil this role (3). The relationship between child and caregiver is not merely one-way either. Several studies have illustrated how the infant or child's own behaviour or even appearance is a potent stimulator of care and nurturing – or their lack. Many of the characteristics of at-risk or malnourished children are such that they will tend to reinforce poor caring activities, which will in turn worsen their situation (23). Children are at their most vulnerable during and immediately after weaning, when breast milk becomes inadequate or is withdrawn, but before the child is

able to fend for itself and is still almost entirely dependent on others for survival.

While little data is available in South Africa on this aspect, some micro-studies do identify the crucial importance of this factor. Breast-feeding is still widely practised, though non-milk liquids and low energy solids are almost universally introduced from an early age, associated with increased infections and growth faltering (5,12,30). The development of malnutrition during the weaning period is clearly visible in the growth pattern from disadvantaged communities, with lack of knowledge or misconceptions regarding feeding practices found to be important (5). Children from disrupted family units with absent fathers, very young or unsupported mothers, and weak family support networks are also more likely to be malnourished (31) and those with psychosocial problems are more likely to be admitted for nutrition rehabilitation (32).

1.4 INTERVENTIONS TO REDUCE MALNUTRITION IN CHILDREN

The three clusters of causes discussed above are used in an analysis of the possible solutions to the problem in South Africa, drawing on international experience.

1.4.1 Health and Health care

The expansion and strengthening of primary health care and the provision through this of appropriate integrated care for childhood illness including malnutrition has been consistently shown to be one of the most effective interventions to reduce deaths, disease and malnutrition in children (3,33). The most common illnesses contributing to malnutrition are diarrhoeal disease and respiratory infections including measles, with their impact being related to severity, frequency and duration of illness. Persistent or repeated attacks of diarrhoeal disease have been shown to be associated with growth faltering and low weight for age. Acute respiratory tract infections may have as significant an impact as diarrhoea. However, the beneficial effect of medical care, including

Oral Rehydration Therapy (ORT), on nutritional status is found to be short lived unless accompanied by an improvement in feeding practices both during and after illness. The most consistent components of health care contributing to improved nutritional status of young children are found to be promotion of breast-feeding and interventions which lead to real improvements in feeding or weaning practices (20).

The prevention of childhood illness, especially through the reduction in diarrhoeal disease brought about by improved water supplies and sanitation, has been shown to impact significantly not just on morbidity and mortality, but also on nutritional status (64,73).

In South Africa, access to primary care is markedly deficient, especially given the resources available (34), although the introduction in 1994 of free health care for pregnant women and children resulted in a marked increase in utilisation of services by this age group (PWV Department of Health 1995 ID: 21). Although the situation is changing, the type of services provided is still not sufficiently comprehensive and integrated to address the needs of children. The 250 clinics in Gauteng run by local government provide largely preventive and promotive care, perhaps including treatment for some "minor ailments", while the 50 clinics run by the provincial government provide largely curative care (35). The challenges of transformation will include shifting the resources in terms of staff and budgets, currently locked into hospital care, into the district system. This will need to be accompanied by training of professionals and the supply of drugs, equipment etc. Apart from maintaining and strengthening the key preventive strategies of immunisation, growth monitoring and nutrition education, the integration of services can be expected to reduce the "missed opportunities" for immunisation and for the promotion of nutrition and growth among those children who only attend the clinic because they are ill.

Beyond the provision of health or medical care, although these are undoubtedly important, projects to improve water supply and sanitation will

undoubtedly have the potential to impact significantly on the incidence of childhood diarrhoea.

1.4.2 Household food security and food supplementation

Household food security and the strategies used to improve food supplies in vulnerable households, has been the focus of many nutrition programmes in the past, including in South Africa. An analysis of the nutrition problem and the degree to which it is a result of a lack of food within the household, is of fundamental importance to programme planning. Interventions designed to increase the supply of food will obviously be ineffectual if this is not the primary cause of the problem (3).

Interventions or strategies designed to improve household food security can be broadly divided into those designed to increase income, transfers in kind including purchase requirements through food stamps, on-site feeding or food provision, and measures designed to impact on household behaviour in relation to food production or purchase. These may be directed primarily at individuals, at families or at the community or public in general (33,36). The focus of this paper is on individual supplementary feeding programmes for pre-school children. An extensive review of such programmes (36) has shown marked variation in cost-effectiveness between them, and highlighted some of the success factors and relevant issues for implementation.

The targeting of individual supplements in accordance with degree of need is always present to some degree. While some supplementation programmes have employed extremely broad or non-specific eligibility criteria (e.g. All children under 5 years of age) (37), it is commonly felt that such an approach is unaffordable and even wasteful (33). The most cost-effective food supplementation programmes have been those where anthropometric criteria have been used to target the malnourished with what is effectively a therapeutic intervention. Resource transfer programmes will show greatest effectiveness if they are targeted to the most affected (3,38). If the goal

however is the prevention of malnutrition by means of increased intakes of food, a different programme design with broader eligibility criteria would obviously be indicated, without this necessarily implying low cost-effectiveness (3,21).

The quantity of the supplement is usually calculated on the basis of the average deficit for key nutrients (energy and protein). Given that, for a measurable improvement in the growth of a malnourished child to be seen, the total intake must approximate the RDA for these nutrients, the amount of the supplement actually consumed by the child becomes critical. While "leakage" of food to non-beneficiaries is of major concern in terms of reducing the impact on the growth of the identified child, in fact such leakage is often to other siblings and this is in effect a de facto broadening of the definition of "beneficiary". Leakage to other family members who may not be nutritionally vulnerable is however common and considerably reduces the nutritional impact of the programme. The sale or exchange of food for non-food items will have a similar effect. On-site feeding, although apparently more costly, results in less leakage than take home food supplements. However, even with on-site feeding, intra-family substitution, with a reduction in the food allocation for the beneficiary, often contributes to reducing consumption by the intended beneficiary. Apart from leakage, an important factor affecting the extent to which the nutrient deficit is met is the size of the deficit, either owing to a very limited household allocation or to the impact of illness on intake and/or nutrient needs (33).

Targeting is often understood to be a mechanism to restrict access to those in need, improving cost-effectiveness through reducing the number of non-needy beneficiaries. An error of inclusion or Type I error occurs when benefits are wrongly distributed to those who do not qualify. However, targeting is equally concerned with correctly identifying and supporting those who should benefit. The situation where the needy who should benefit are excluded (an error of exclusion or Type II error) may be more important in determining the impact of the programme among the population at risk and can be described as "a failure

in the prime objective of the programme" (21). This may arise due to the distribution system and access to it as well as the eligibility criteria themselves. (33,36).

Although supplementation can be of undoubted benefit when a lack of food is a contributory causal factor, under field conditions the impact is often disappointing and the required duration of supplementation can extend to 1 or 2 years (33). In well-designed and managed projects however, where problem definition and programme design are clear and appropriate, the cost per beneficiary and the demonstrable impact on mortality and undernutrition show that such an intervention can be positive (33,36,38). However, there is always a trade-off to be made between the benefit made available to those in need and the costs of administering such a programme, as compared to a more loosely targeted and administered one (39). Apparently favourable cost-benefit ratios may hide the costs of not addressing the problem among the most needy and deprived. As errors of exclusion are likely to be higher in situations where malnutrition is widespread, the importance of clearly defining the extent and nature of the problem becomes apparent once again (21).

A wider argument relating to food supplements is the relative benefits of food versus income support. While all the above arguments relating to errors of inclusion and exclusion of beneficiaries apply, the concept of "leakage" here is somewhat different, as at issue is the extent to which income support is reflected in increased consumption of food by the most vulnerable. Recent work has begun clarifying just how complex decisions on the use of resources and the beneficiaries of such resources within households are, and suggest that greater impact might be obtained from a policy approach that focuses on prices rather than on incomes (40).

1.4.3 Caring practices

The third "causal cluster" of "care" and the critical importance of this aspect for child good growth and development is a new focus for nutrition programmes. It

is one of the reasons why children from similar environments do not have the same health outcomes. Most interventions designed to improve the health and nutrition of small children rely on the caregiver to implement them adequately. The importance of caregiving behaviour is even more important in resource-poor households (23).

With a clearer understanding of the context within which behaviour of family members is determined, a fresh look at information strategies becomes imperative. The "old" methods of delivering "nutrition education" in the form of a lecture to an (unwilling) audience have been sufficiently proven to be completely ineffectual. However, it is equally evident that the provision of information to families and caregivers that enables them to understand what options are available to them and what the consequences are of the choices they make can undoubtedly impact on behaviour. This does mean that such inputs need to be locally determined and relevant, developed at a community level to respond to local situations and concerns (41).

However, if one simply looks at the world of advertising, it is obvious that people's behaviour is changed by things that they see and hear, by information that is given to them in a more impersonal way than through such community-based interventions. A somewhat different approach to achieving the kind of behaviour change that is fundamental to improving childhood nutrition is that which advocates learning from such commercial successes and applying them through "social marketing". This approach is widely misunderstood and hence somewhat distrusted by many, but can be defined as: "the use of commercial marketing techniques ... to understand and address a social problem" (42), or alternatively "the application of marketing principles to social programme design and management" (43). If the principles of proper design based on well-researched problem and message definition and proper management of the project are adhered to, there is no doubt that impressive successes have already been seen at relatively low cost (42,43). It is clear however that new policy directions are needed and that their implementation will in turn need the development of an adequate skills base to ensure that quality is adhered to

(42).

Feeding practices are one of the critical components of caring practices within households, where information strategies need to focus in order to support or facilitate the types of decisions that will impact favourably on childhood nutrition. Strategies, whether community-based or using social marketing or both, need to actively protect and promote breast feeding and recognise the factors which enable women to breast feed successfully (1). Cultural factors which affect the degree to which mothers will actively encourage their children to eat, especially when ill or anorexic, need to be understood and encouraged (41). The association between female education and the adoption of preventive practices ranging from immunisation and oral rehydration to basic hygiene and health-care seeking behaviour has led to the inclusion of female education as part of some nutrition strategies (16), although it is also argued that this effect is due to underlying factors which impact on both education and behaviour. Information strategies that convey both the importance and the local feasibility and desirability of health-promoting behaviour are once again of fundamental importance (41). The importance of the emotional support and cognitive stimulation which children require from their caregivers if they are to develop optimally is becoming increasingly clear, particularly in relation to very young children (23).

All of these highly desirable aspects of care become more feasible and realistic if the primary caregiver, who continues to be the mother or another female household member in the overwhelming majority of cases, is herself supported, protected, nurtured and informed. Broader community-based and political strategies which impact on the status of women can therefore be expected to be the most effective here, although community-based initiatives can also contribute (16,40).

1.4.4 Growth Monitoring

Growth monitoring, or the "regular measurement, recording and interpretation

of a child's growth in order to counsel, act and follow up results" (44) has been widely practised around the world during the past 3 decades. Opinions and evidence about its usefulness in child health services are increasingly offset by questions as to its efficacy and cost effectiveness as a tool for improving child survival and wellbeing, as made clear in recent reviews of growth monitoring (44,45). Growth monitoring has been proposed as an "integrating strategy" within the child survival initiative (46)and indeed it can address all three of the "causal clusters" identified within the framework described above. It is however argued that questions about its effectiveness are bedevilled by a lack of clarity as to its purpose (44,45), perhaps intensified precisely by the diverse nature of its possible applications.

A useful proposal identifies three of the major functions of growth monitoring as being "a tool for screening/targeting, an educational/growth promotional tool or a tool for surveillance" (45).

Growth monitoring is widely used as a screening tool in order to target underweight or at-risk children for interventions such as food supplementation. As for any screening tool, certain prerequisites must be met if the activity is to be considered useful. The coverage of the population must be as complete as possible in terms of regularity and number of contacts, and must not demonstrate self-selection or exclusion of portions of the population (especially of the most needy whom the programme is targeting). Misclassification of those screened must be minimal, the costs of screening must be low when compared to the costs of indiscriminate intervention for all children and effective action must follow for those identified as needing it (44,45).

While growth monitoring is very widely practised, many studies have shown that clinic attendees are a self-selected group with respect to many of the determinants of malnutrition, and that the nutritional status of these children is significantly better than that found in community-based surveys (44,47,48). Misclassification is a significant problem due to the high proportion of

measurement and systematic error under field conditions (44). Further questions have also been raised about the feasibility and appropriateness of the recent emphasis on weight gain or growth faltering as a risk indicator or screening tool, rather than weight for age. Weight for age has been shown to be more sensitive in identifying high risk children than change in weight at all levels of specificity, however the importance of compounded measurement errors in serial measurements under field conditions may be affecting the usefulness of growth monitoring data (7). The very low specificity of growth faltering is also calling into question its use as a screening tool. An assessment in three different populations showed the levels of failure to gain weight or of "growth faltering" over a three month period to be of the order of 18% and 37% respectively even in a wealthy community, while rates of 40% and 80% were found in poorer communities (49).

One aspect of the use of growth monitoring as a screening tool is that of using it to direct health workers' attention towards possible chronic illness {53}. Growth failure, in the absence of a clear indication of lack of food as the causative factor, may be due to frequent or persistent diarrhoea or to underlying urinary or pulmonary infection (e.g. tuberculosis) which may otherwise be missed, especially in a service environment where continuity of care is impossible. Conversely, its use as a clinical tool extends to assessing when previously diagnosed and treated illness is now cured, as evidenced by a gain in weight.

There is little quantitative information on the cost of growth monitoring per se. However, it is apparent that significant resources are invested in this activity, both in terms of equipment and of staff time and training, whose opportunity costs should not be forgotten. On the other hand, the response to this investment of time and resources has not been shown to result in earlier or more effective interventions, improved nutritional status or reduced mortality (48,50,51). Several authors have questioned whether other simpler screening tools should not be introduced such as arm circumference {54}. Others have questioned both the cost-effectiveness and the ethical basis for continuing to

use a costly screening tool with doubtful efficacy in the face of clear evidence of widespread nutritional problems (45).

The use of growth monitoring as a tool for education and health promotion, and particularly its potential to result in a change in behaviour, has shown variable results. Reviews of the literature (44,45) once again show that the results in health service settings have usually not been positive. Knowledge of and understanding by health workers or mothers regarding the process and its impact on growth is very limited and time spent on counselling and interaction as a result of growth monitoring is minimal. However, when used in a community-based setting with well motivated and trained workers (who are often not health professionals), it has proved to be a useful tool for mobilising mothers, volunteers and communities as part of a problem-solving exercise around childhood nutrition (12,16,44,47).

These comments are also applicable to growth monitoring used as a tool for surveillance of nutritional status, and the use of aggregate data for programme planning and evaluation. The multiple problems and inaccuracies highlighted above have led to the recognition that accurate data can only be obtained through periodic surveys, as proposed in the South African Nutrition Surveillance System (52). This does not preclude the use of aggregated data at community level to highlight a problem as part of a problem-solving and developmental exercise (53). Further, while periodic surveys will provide data of better quality, it will be too broad to inform geographic mapping in a Geographic Information System (GIS) or to enable targeting of needy communities.

1.5 SOUTH AFRICAN NUTRITION PROGRAMMES

The inequalities inherent in South African society for over a century have meant that the African (and "coloured") communities are those most affected by poverty and malnutrition. However, the first Carnegie Inquiry into poverty in

South Africa in 1929 essentially addressed poverty in the white population, recommending that economic measures were the key to solving the ill health and malnutrition found {38,39). However, the approach was broadened in the 1940's with the establishment of a National Nutrition Council and eventually a Department of Nutrition. These structures oversaw the implementation of "action oriented, comprehensive and sectorally integrated nutrition policies and programmes ... which) .. proved to be very effective and successful" {39}.

The political climate changed however with the consolidation of the power of the nationalist government in the 1950's, and the Council and the Department ceased to exist. Although the nutrition situation among the African and coloured populations continued to be of a serious nature, there was no organised national effort to address this (54,55). Only in 1984, when the Second Carnegie Inquiry into poverty highlighted the effects on nutrition status of race and socio-economic indicators and the changing political climate meant that such stark disparities were increasingly embarrassing, were measures taken to bring about some change. An Emergency Food Scheme with limited scope and budget was initiated in 1985 and a Committee for the Development of a Food and Nutrition Strategy for Southern Africa was appointed in 1989. The recommendations of the Calitz Commission on Poverty (1990) together with political opposition to the introduction of Value Added Tax on previously exempted basic foodstuffs, led to the establishment in 1990/91 of the Nutrition Development Programme (NDP) as a clinic-based food aid programme for those likely to be affected by VAT. It was subsequently broadened to one with a community-development approach to meeting basic needs of communities and became the National Nutrition and Social Development Programme (NNSDP). The NNSDP distributed an annual budget of R400 million through NGOs on the basis of project proposals, but was caught up in the political changes at that time which, together with highly questionable allocation and control processes, severely affected the credibility and legitimacy of the programme (56). The original broad focus was progressively refined to vulnerable target groups, though it is doubtful whether this policy change was ever reflected in the allocation of funds {39}.

The Protein Energy Malnutrition (PEM) Scheme was introduced in the late 1960's and early 1970's as a food supplementation scheme. The small annual budget of R200 000 was used to subsidise the purchase by Local Authorities of skimmed milk powder and later of enriched formulated foods. These products were for distribution to malnourished children or individuals identified through the clinics. The scheme was used in 1991 to channel the much broader range of food stuffs to poor families through the NDP (see above) but this load on the clinics proved to be unworkable. With the establishment of the NNSDP functioning through NGOs, the PEM scheme was also re-vamped.

The Modified PEM scheme, with a budget of R 40 million, was introduced in 1993 for eight defined vulnerable or malnourished target groups, namely infants 0-6 months, young children 7-12 months, 13-36 months, 37 –60 months, underweight pregnant women, pregnant women not gaining weight, underweight lactating women and underweight elderly or chronically ill persons. A further target group consisted of any of the above likely to suffer from a vitamin or mineral deficiency (57).

The food supplements included, apart from skimmed milk powder, a number of commercial breast milk substitutes and an "artificial" or formulated food called PVM for Protein-Vitamin-Mineral supplement or mix. The purchase of these products was subsidised for Local Authorities in the Republic of South Africa and the Self-governing Territories (not the so-called "bantustans", where the majority of the poorest South Africans lived). Though the scheme was seen as providing a supplement for specific at risk or malnourished individuals, the quantity only provided 20% of the Recommended Dietary Allowance for Energy; insufficient to meet the needs of malnourished children. There was reported to be significant leakage of certain foodstuffs to other family members (56) while the formulated "PVM" was "unknown, unpalatable and nutritionally inadequate" {39}.

Local Authorities were charged with providing preventive and promotive (not

curative) services, and this meant that a co-ordinated service that could assess and deal with the multiple determinants of childhood malnutrition, most notably with childhood illness such as diarrhoeal disease, was virtually impossible. Although nutrition education was seen as part of the scheme, the methodology followed that current within the health services, namely lectures or talks to deliver the requisite information to passive mothers. The messages were undermined by the practices of the scheme itself, which distributed breast milk substitutes through the clinic system to very young babies in direct contravention of the Code for the Marketing of Breast Milk Substitutes (56,58). Even the linkage with growth monitoring was often tenuous, with routine statistics showing no apparent link between the numbers of children reported as meeting one of the entry criteria, namely low weight for age, and the numbers on the scheme (59).

1.6 RATIONALE FOR THE STUDY

The motivation for conducting this study therefore is to provide the kind of information that could contribute to the effort to redirect and refocus what had been seen as a very problematic scheme. There was a perception that the scheme was benefiting those who did not actually need it, while those who should have been benefiting were not {39,41,37}. Given the importance of targeting decisions by management to ensure the optimal use of limited resources, this has been the major focus of this study.

In addition, it is recognised that one of the weaknesses of "research studies" is that they can project a moment in time rather than progress (or its lack) over time (60). There is a critical need to develop tools that can be used under routine service delivery conditions, as part of the mechanism for monitoring of service implementation. This consideration has dictated the use of routine data and of simple methodologies, which can be feasibly adapted for ongoing use by management.

2 OBJECTIVES AND METHODS

2.1 OBJECTIVES

The aims and objectives of the study were to support the redirection and restructuring of the food supplementation or PEM scheme in Gauteng province through an assessment of the strengths and weaknesses of the targeting process.

The specific objectives were:

to identify which target groups are the major beneficiaries of the scheme in the magisterial districts of Gauteng Province.

to assess the expenditure on food supplementation in the different magisterial districts

to relate the information on food supplementation to the population and to indices measuring need within each magisterial district

to examine the process for identification of beneficiaries aged 0-6 years in selected clinics

to propose a mechanism for provincial monitoring of the scheme

2.2 METHODS

This descriptive study consisted of two parts: a retrospective analysis of

available routine reports on PEM scheme beneficiaries and subsidies and a prospective study of a sample of clinic attendees.

2.2.1 RETROSPECTIVE STUDY

Through documentary review, routine statistics were analysed to provide basic information on access to the scheme and the relative weight of each type of intervention/ target group. A rough proxy for geographic access to the scheme was mapped for the whole province in terms of those local authorities who were implementing the scheme. This was related to estimates of population to approximate coverage, as well as to poverty indices to evaluate targeting.

2.2.1.1Unit of study and sample:

No sampling was used, as all routine data collected from Local Authorities (see list in Appendix) for the year in question (1994/95) were analysed. The percentage of reporting periods for which data was available (the "response rate") was calculated for each local authority. Local authorities were then grouped together within the magisterial districts within which they fell, and all analysis was done in relation to this geographic area. Data from provincial clinics was not recorded in the same format and their implementation of the scheme was limited to a few areas of the province, with only 2329 beneficiaries (1.2% out of the total of 198992). They were therefore not included in this part of the study.

2.2.1.2Data collection tools:

Data was extracted manually from routine reports and recorded on a spreadsheet. The variables and the source of each are listed under 2.2.1.

2.2.1.3Sources of data:

2.2.1.3.1 Interventions for beneficiaries:

The eight target groups defined by the scheme (infants 0-6 and 7-12 months, children 13-36 and 37-60 months, pregnant women and lactating women, the chronically ill and the elderly) were considered an unnecessarily large number of groups for the purposes of the study. They were therefore grouped into 5 groups (infants 0-12 months, children 13-36 months, children 37-60 months, pregnant and lactating women and the elderly and chronically ill). The relative frequency of enrolment of beneficiaries during 1994 of each of the five target groups was determined from

routine quarterly statistics from the implementing authorities (Local Authorities and the Provincial Administration).

For six authorities where the routine information was incomplete, the data for the time period available was averaged and annualised. Information on interventions had not been submitted for one of the local authorities in the magisterial district of Johannesburg. Information for the following year (1995/96) for this local authority was therefore adjusted and used. The claims for the year for which data was available (1995/6) were compared to the claims for the year of the study (1994/5) to determine the percentage growth in the scheme. The number of interventions for 1995/6 was then reduced by this same percentage to give an estimate of interventions for 1994/5.

2.2.1.3.2 Expenditure:

The scheme provided a subsidy for the purchase of specified products, paid out against claims from the implementing authorities, which were documentary proof of purchase of the specified products. The amounts of these claims against expenditure were also entered into the spreadsheet as total annual expenditure.

2.2.1.3.3 Population size and poverty indices:

Population figures were those used by the provincial government at that point in time (59). These figures were based on the 1991 population census figures and were obtained from the Development Bank of Southern Africa (DBSA). Two socioeconomic indices also provided by the D13SA were entered into the spreadsheet for each magisterial district, namely the Human Development Index and the Poverty Gap.

The Human Development Index is a composite, relative index used internationally by the United Nations Development Programme (UNDP) to rate and rank countries in terms of development. The formula uses data that

internationally is generally available, although the degree of accuracy may vary. It is based on measures of life expectancy, literacy and income, and is seen as "a measure of people's ability to live a long and healthy life, to communicate, to participate in the life of the community and to have sufficient resources to obtain a decent living" (61). It provides a method of measuring the relative socio-economic development of countries or, in this case, of provinces or of magisterial districts. The Human Sciences Research Council (HSRC), using the best available data performed the analysis in accordance with the UNDP formula using data from the Project for Statistics on Living Standards and Development (PSI-SD) and the 1991 population census (11,61,62).

Classic indicators of poverty (the poverty head count and head count ratio) measure the prevalence of poverty as seen in the number and proportion of poor individuals in relation to the population as a whole. The HSRC has also developed an additional poverty indicator, the "poverty gap", which reflects the depth of poverty as well, through summing the number of individuals below the Minimum Living Level and the amount by which they are below it. It indicates the theoretical minimum government transfer to poor households needed to totally eliminate poverty and is thus well suited to guiding allocation decisions (62). The absolute monetary estimate per household is then converted into a fractional share for each geographic area, in this case, each magisterial district in the province of Gauteng. The higher the fraction, the greater the poverty in that magisterial district.

2.2.1.4 Analysis:

Numbers and percentages of beneficiaries as well as expenditure per beneficiary and per capita were calculated for each magisterial district.

Values for interventions and expenditure per capita were correlated with the indices of poverty to test if there was a significant relationship between implementation of the scheme and expected determinants of malnutrition.

2.2.2 CROSS SECTIONAL STUDY

An exit interview of caretakers of children under 6 years was carried out at a sample of clinics to evaluate the process of selection of beneficiaries of the scheme.

2.2.2.1 Selection of clinics:

One of the six regions in Gauteng province was chosen to carry out a more in depth study at selected clinics. The Vaal was chosen because it is fairly underresourced and because it has services run by both Local Authorities and by the Provincial Administration. In addition its size and proximity made the study logistically feasible.

The 6 provincial administration clinics and the largest local authority with 7 clinics were identified as the two units of study. This definition of a unit of study reflects the view that local implementation of the national programme would reflect the policies developed at the level of each implementing authority. Two clinics were randomly chosen from each of these two authorities, at which a sample of clinic attenders were interviewed on leaving the clinic.

2.2.2.2Sample size:

The sample size was calculated for each authority based on the average number of children attending the services of the authority in the months prior to the study Table 1). As no information was available on the expected rateof errors in growth monitoring, this was assumed to be 50% with an acceptable margin of error of 10% (using 95% confidence limits).

Table 2-1 – AVERAGE MONTHLY ATTENDANCE FIGURES AT CLINICS AND SAMPLE SIZE REQUIRED

LOCAL AUTHORITY		PROVINCIAL	
Clinic 1	90	Clinic 1	240
Clinic 2	153	Clinic 2	545
Total	243	Total	785
Sample size required	108		157

Due to bad weather, the monthly attendance at the less busy clinics was lower than normal. Although the fieldwork was extended to three weeks in an attempt to reach the required sample size, this was not possible.

2.2.2.3Data collection tools:

Interview questionnaires were developed to record the presence or absence of those conditions meeting the national criteria for enrolment in the scheme, based on information provided by the caregiver of the child on leaving the clinic. Anthropometric data from the child's growth chart was copied onto a

blank chart attached to the questionnaire. No independent verification of measurements was undertaken.

The questionnaires were translated into Zulu by the interviewers themselves, during their theoretical training session. At this session, consensus was reached among them as to the correct translation.

The methodology and the data collection tools were piloted at 2 clinics in the province, chosen to be similar to the selected clinics. The pilot was also used to train the interviewers and to test the translation. Sampling procedures, organisation and the data collection tools were evaluated and necessary changes introduced.

An unexpected finding during the pilot study was that milk powder was distributed to almost half the mothers. It was suspected that this very high level of distribution of milk powder was due to altered behaviour by the nursing staff, who were aware of the reasons for the study and therefore felt it appropriate to demonstrate that the PEM Scheme was being implemented. This finding resulted in the inclusion of data on immunisation and minor ailments in the questionnaire in order to avoid the bias resulting from altered staff behaviour if they were aware of the reasons for the study.

2.2.2.4Variables studied:
Whether interviewee was habitual caregiver of child ("no" = elimination)

2.2.2.4.1 For all caregivers of children under 6 years of age:
Relationship to child -- mother, grandmother, other

Reason for attendance - illness, immunisation, weighing, other

Road -to-Health-Chart - Y/N

Age in months

Weighed this visit - Y/N

Explanation re growth - Nothing said, growing well, growing poorly, no further comment, growing poorly, return or treat, other

Food supplementation - Y/N, reason if Y

2.2.2.4.2 For babies under 1 year only:

Breast feeding - Y/N

Ever asked if breast feeding, ever explained benefits - Y/N

If not breast feeding; ever explained re-lactation – Y/N

2.2.2.4.3 Analysis of growth chart:

Weight plotted this visit - Y/N

More than one plotted weight- Y/N

If chart adequate - Curve flat >2 months, curve down >2 months, curve up

Weight/age < 3rd percentile

2.2.2.5Organisation of field work:

The study was carried out by a group of 6 trained interviewers paid a daily rate. They were not health workers but had previous experience with health-related survey work.

A dietician working for the Provincial Administration provided day-to-day supervision, reporting back daily to the researcher who was thus able to control the quality of the data being collected.

Interviewer training and piloting of the questionnaire was completed in 2 weeks. The interviews were carried out over a period of 3 weeks in March 1995. All caregivers of children under 6 years of age were interviewed on leaving each of the selected clinics on all days on which children were seen during the three weeks of the study, until the requisite number was obtained. Each interview took between 5 and 10 minutes to complete.

It had been intended to conduct separate interviews on those caretakers whose children were enrolled in the PEM scheme. However, at the clinics sampled for the study, it was found that the numbers on the scheme were very low and that they did not come on specific days but attended together with the other children. A standard questionnaire was therefore completed for all children.

Numbers were too low to necessitate the use of systematic sampling at the clinics. At two of the clinics, the study had to be prolonged into a third week in order to permit the stipulated sample size to be obtained.

2.2.2.6Analysis:

Quantitative information on questionnaires was pre-coded and the data were analysed using a personal computer. Standard packages (Epi-info and SPSS)

were used for the statistical analysis. Simple descriptive statistical calculations were done using a 95% confidence interval.

Qualitative and semi-qualitative data were scanned by the researcher and categories of replies identified. Data was then transcribed into these categories and summaries made.

Criteria used for inclusion in the PEM scheme were specified as follows, based on the national criteria for supplementation through the PEM scheme. An additional category of "at risk" was defined by the researcher. Children were classified in relation to the following criteria:-

2.2.2.6.1 Babies 0 – 6 months:

non-breast fed and re-lactation not possible PLUS < 3rd percentile OR weight gain unsatisfactory or weight loss over 2 – 3 months

2.2.2.6.2 Infants and children, 7 months to 6 years:

weight < 3rd percentile OR weight gain unsatisfactory or weight loss over 2 – 3 months

(The study did not attempt to verify whether the family could not afford to purchase milk powder, which is also specified as a condition.)

2.2.2.6.3 Additional category "at risk":

duration of unsatisfactory weight gain or weight loss less than 3 months but weight close to the 3rd percentile, and no reason for lack of weight gain apparent ("illness" not a reason for attendance); OR breast fed baby under 6 months with weight loss or no weight gain

In addition, in one child the situation was so acute (marked weight loss with very low weight for age) that referral was identified as the appropriate course of action.

The researcher classified the appropriate response to these children into three:-

Meets criteria for PEM scheme – provide food supplement, nutrition education

Child "at risk" – re-assess on a return visit, nutrition education.

Serious illness / malnutrition – refer

These identified courses of action were compared to the actual action taken by the health worker, as reflected in the exit interview, to enable a conclusion to be drawn regarding "correctness" of the actual course of action.

3 RESULTS

3.1 RETROSPECTIVE STUDY

3.1.1 Distribution of beneficiaries by target group

Table 3.1 and Figures 3.1 and 3.2 show the breakdown of interventions provided to beneficiaries by target group for each magisterial district and for the province as a whole. A wide range in enrolment by target group is seen around the province. For children aged 0-6 months, the figure for the province is 9% while the range is from 5 to 30%, for children 7-36 months enrolment as a percentage of total ranges from 8 to 87% with an overall figure of 23%. The enrolment of people with chronic diseases similarly ranges from 1 to 52%. While the age group 37-60 months constitutes 40% within the province as a whole, this is largely due to the very large number seen in Johannesburg. If the information from Johannesburg is excluded, in the remaining districts this age group makes up only 5% of the total.

These figures represent the annual number of visits, not numbers of beneficiaries. If an average duration of 6 months of supplementation is assumed and thus 6 interventions or visits per beneficiary, actual beneficiaries in the age group 7-36 months number approximately 9100, while there are under 13200 beneficiaries aged 37-60 months and about 300 infants under 6 months.

Similarly, the relative emphasis varies between magisterial districts, with Alberton having small numbers, half of which are the chronically ill and elderly, while in Krugersdorp, with similar numbers, almost a quarter of their beneficiaries are under 6 months of age. Johannesburg has the largest total number, 70% of whom are children aged 37-60 months, although the 6% who are aged 0-6 months also constitute the largest absolute number in this age group. Pretoria, Vanderbijl Park and Vereeniging show the largest numbers

and percentages in the 7-36 month age group.

Table 3-1 INTERVENTIONS BY TARGET GROUP, BY MAGISTERIAL DISTRICT IN GAUTENG FOR THE YEAR 1994/1995

MAGISTERIAL DISTRICTS	0-6 M	%	7-36 M	%	37-60 M	%	WOMEN	%	CHRONIC ILL, AGED & OTHER	%	TOTAL
ALBERTON	306	20	563	37	52	3	13	1	585	39	1519
BENONI	610	11	3814	72	113	2	84	2	709	13	5330
BOKSBURG	186	8	1565	70	125	6	34	2	315	14	2225
BRAKPAN	2338	12	7301	37	3090	16	1618	8	5322	27	19669
BRONKHORSTSPRUIT	17	5	140	44	1	0	77	24	82	26	317
GERMISTON	1581	30	2292	43	335	6	298	6	802	15	5308
HEIDELBERG	89	10	415	48	104	12	221	25	40	5	869
JOHANNESBURG	6127	6	8461	8	72095	69	209	0	16958	16	103850
KEMPTON PARK	217	25	521	60	7	1	6	1	122	14	873
KRUGERSDORP	325	23	733	52	241	17	72	5	32	2	1403
NIGEL	177	23	502	64	3	0	27	3	72	9	781
OBERHOLZER	571	16	942	26	439	12	662	18	1018	28	3632
PRETORIA	1259	10	7780	61	1109	9	225	2	2284	18	12657
RANDBURG	309	10	868	27	309	10	241	7	1499	46	3226
RANDFONTEIN	90	15	470	80	12	2	7	1	8	1	587
ROODEPOORT	12	9	116	87	1	1	2	2	2	2	133
SPRINGS	959	20	393	8	328	7	677	14	2546	52	4903
VANDERBIJLPARK	1979	14	8295	58	484	3	616	4	2918	20	14292
VEREENIGING	593	5	8042	65	12	0	2780	22	1017	8	12444
WESTONARIA	356	14	1317	51	77	3	97	4	732	28	2579
WONDERBOOM	9	14	31	47	9	14	3	5	14	21	66
TOTAL	18110	9	54561	28	78946	40	7969	4	37077	10	196663

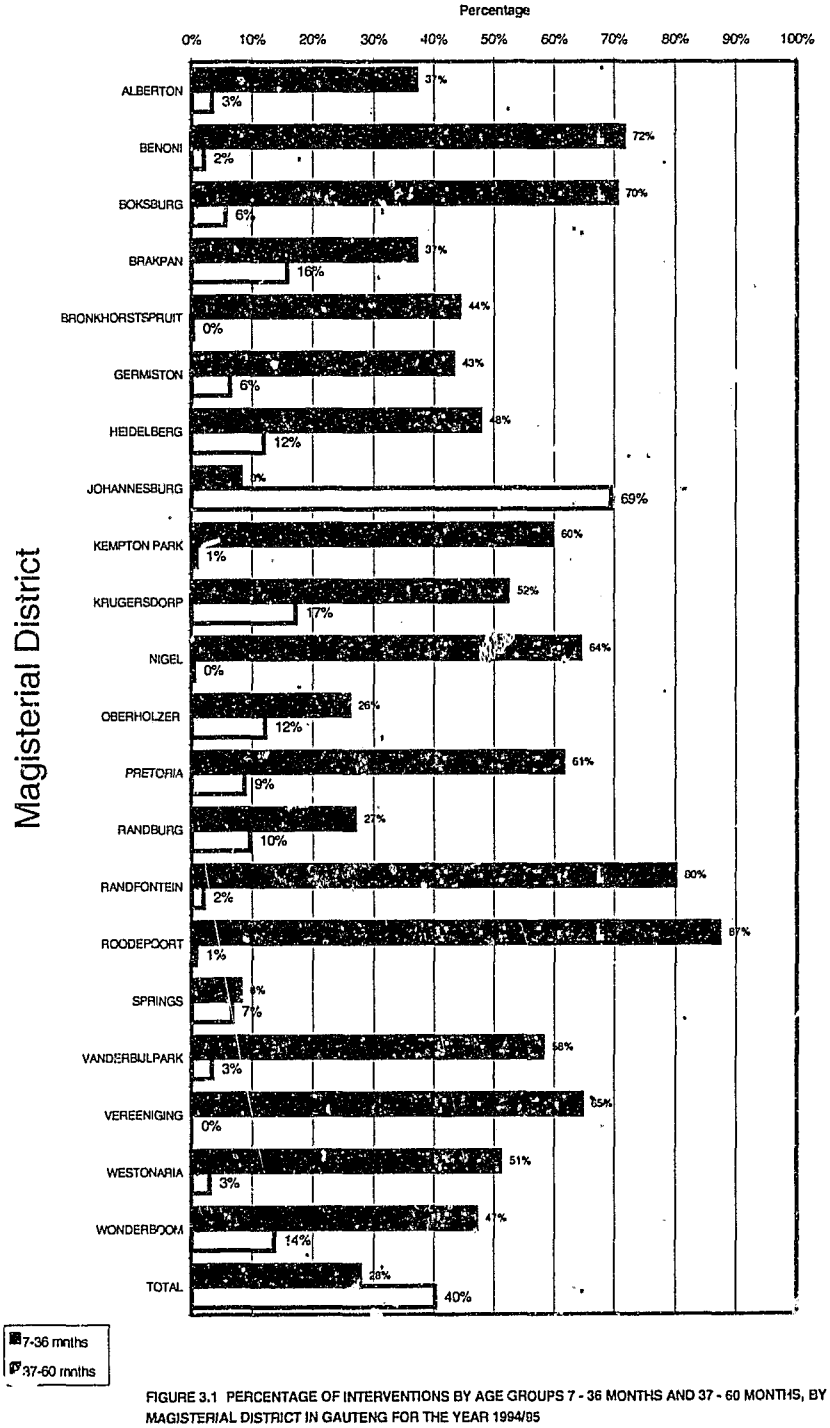


FIGURE 3.1 PERCENTAGE OF INTERVENTIONS BY AGE GROUPS 7 - 36 MONTHS AND 37 - 60 MONTHS, BY MAGISTERIAL DISTRICT IN GAUTENG FOR THE YEAR 1994/95

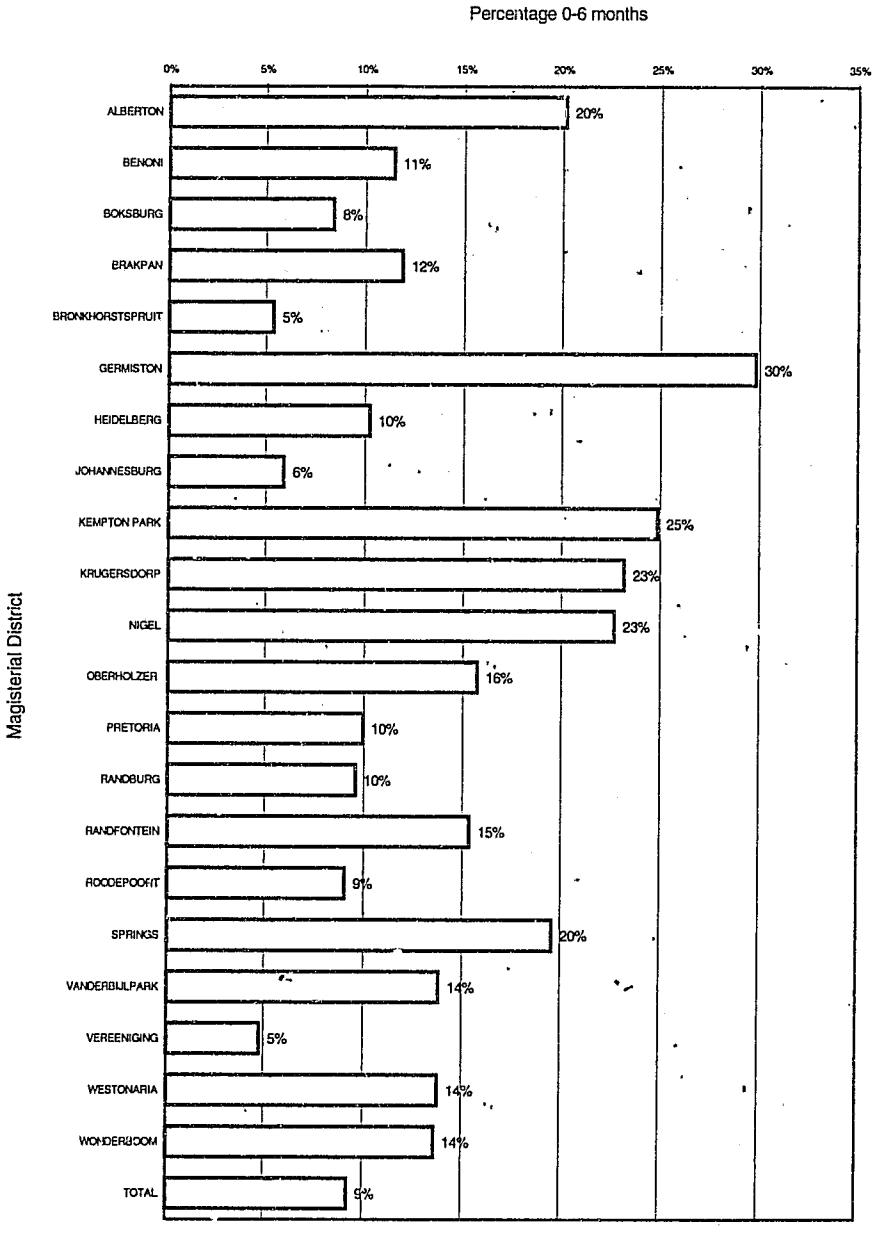


Figure 3.2 PERCENTAGE OF INTERVENTIONS BY AGE GROUPS 0 - 6 MONTHS, BY MAGISTERIAL DISTRICT IN GAUTENG FOR THE YEAR 1994/5

Expenditure per intervention

Table 3.2 and Figure 3.3 show the total expenditure by magisterial district for the financial year 1994/95, as reflected in their claims for reimbursement. This is related to the number of interventions for that period to give expenditure per intervention for each magisterial district and for the province as a whole. Once again, the variation is shown to be considerable.

Table 3-2 –EXPENDITURE PER INTERVENTION BY MAGISTERIAL DISTRICT IN GAUTENG FOR THE YEAR 1994/1995

MAGISTERIAL DISTRICTS	Expenditure (Rand)	Interventions	Expenditure/ Intervention (Rand)	Expenditure / beneficiary (Rand) •
Alberton	30000	1519	19.75	3.29
Benoni	121115	5330	22.72	3.79
Boksburg	2635	2225	1.18	0.20
Brakpan	164335	19669	8.36	1.40
Bronkhorstspruit	4256	317	13.43	2.24
Germiston	40545	5308	7.64	1.27
Heidelberg	15501	869	17.84	2.97
Johannesburg	110057	101948	1.08	0.18
Kemptonpark	38405	873	43.99	7.33
Krugersdorp	N/A	1403	N/A	N/A
Nigel	18805	781	24.08	4.01
Oberholzer	124964	3632	34.41	5.74
Pretoria	132360	12582	10.52	1.75
Randburg	94534	3226	29.30	4.88
Randfontein	39829	587	67.85	11.31
Roodepoort	N/A	133	N/A	N/A
Springs	26812	5903	4.54	0.76
Vanderbijlpark	358910	11374	31.56	5.26
Vereeniging	79332	11427	6.94	1.16
Westonaria	69200	2579	26.83	4.47
Wonderboom	3025	66	45.83	7.64
TOTAL	**1474620**	191751	7.69	1.28

• = assuming 6 interventions per beneficiary

Assuming an average of 6 visits per beneficiary (see section 1), the cost per beneficiary is also given in Table 3.2. The range of costs per beneficiary varies from R0.20 to R11.31 with an average of R1.28 per beneficiary.

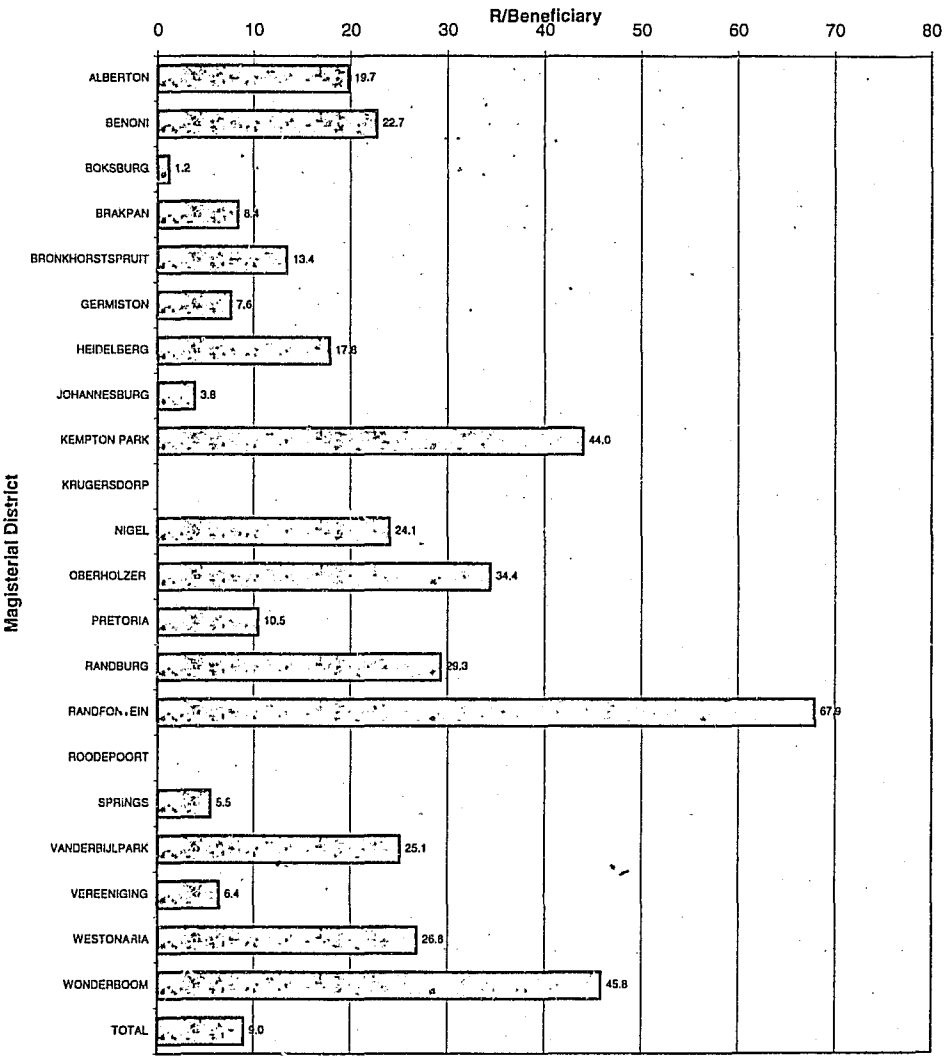


FIGURE 3.3 EXPENDITURE PER BENEFICIARY IN RANDS, BY MAGISTERIAL DISTRICT IN GAUTENG FOR THE YEAR 1994/95

- For two magisterial districts (Krugersdorp and Roodepoort) no claims were received for the year in question. This may either reflect missing data, or that they used stocks from the previous year, given that their numbers were very small).

3.1.2 Interventions and expenditure per capita

Table 3.3 and Figure 3.4 show the information on interventions and expenditure, related to the population of each magisterial district to give a measure of service provision and expenditure per capita for each magisterial district.

In relation to interventions per capita, the average for the province is seen to be only 0.0292, with the magisterial district of Wonderboom showing the lowest figure at 0.0002, or only 66 interventions for a population of 285 000. On the other hand, Benoni, with 5330 interventions for a population of 310 000, reaches a figure of 0.1720.

The average expenditure per capita is R0.26, and although Wonderboom is once again the lowest, with a per capita expenditure of 1 cent (R0.01), expenditure in Brakpan is R1.17 per capita. In only is an expenditure of near or above R0.40 per capita achieved.

Table 3-3 EXPENDITURE AND INTERVENTIONS PER CAPITA, BY MAGISTERIAL DISTRICT IN GAUTENG FOR THE YEAR 1994/1995

MAGISTERIAL DISTRICTS	Interventions	Expenditure (Rand)	Population	Interv/Capita	Exp/Capita (Rand)
Alberton	1519	30000	394620	0.0038	0.08
Benoni	5330	121115	309559	0.1720	0.39
Boksburg	2225	2635	210114	0.0106	0.13
Brakpan	19669	164335	139929	0.1406	1.17
Bronkhorstspruit	317	4256	41405	0.0077	0.10
Germiston	5308	40545	183985	0.0289	0.22
Heidelberg	869	15501	82645	0.0105	0.19
Johannesburg	103850	396422	1688880	0.0615	0.23
Kemptonpark	873	38405	380500	0.0227	0.10
Krugersdorp	1403	N/A	210450	0.0067	N/A
Nigel	781	18805	99611	0.0078	0.19
Oberholzer	3632	124964	190603	0.0191	0.66
Pretoria	12657	132360	716162	0.0177	0.18
Randburg	3226	94534	366209	0.0088	0.26
Randfontein	587	39829	124846	0.0047	0.32
Roodepoort	133	N/A	235044	0.0006	N/A
Springs	4903	26812	169139	0.0290	0.16
Vanderbijlpark	14292	358910	465485	0.0307	0.77
Vereeniging	12444	79332	268682	0.0463	0.30
Westonaria	2579	69200	172140	0.0150	0.40
Wonderboom	66	3025	285458	0.0002	0.01
TOTAL	196663	1760985	6735466	0.0292	0.26

N/A = Not available

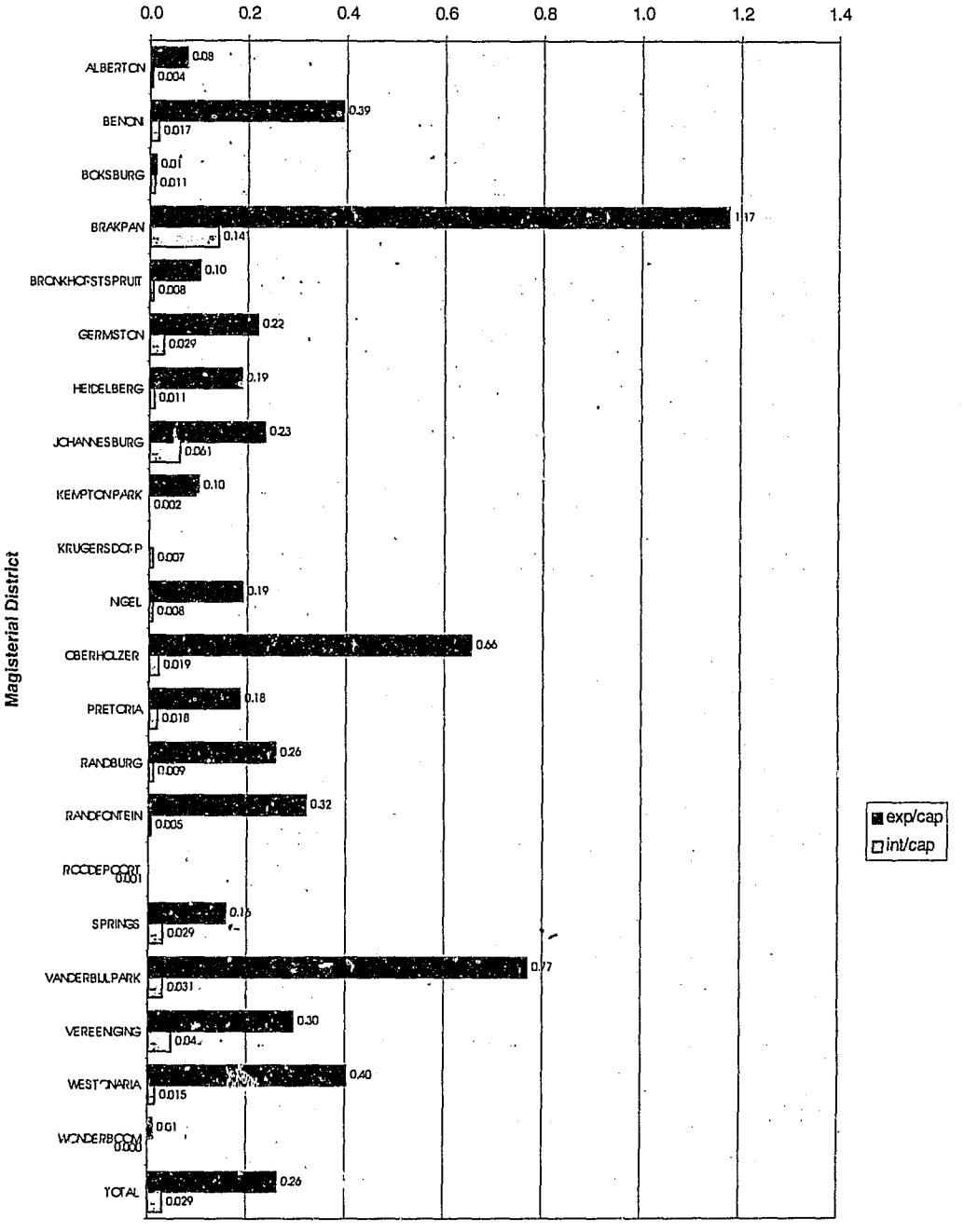


FIGURE 3.4 NUMBER OF INTERVENTIONS AND OF EXPENDITURE IN RAND, PER CAPITA, BY MAGISTERIAL DISTRICTIN GAUTENG FOR THE YEAR 1994/95

3.1.3 Expenditure an ; interventions in relation to indices of poverty

Table 3.4 sets out measures of programme implementation and coverage (interventions and expenditure per capita) together with two indices of poverty, namely the Human Development Index (HDI) and the Poverty Gap index.

TABLE 3.4 – EXPENDITURE AND INTERVENTIONS PER CAPITA RELATED TO INDICES OF POVERTY, BY MAGISTERIAL DISTRICT.GAUTENG 1994/1995

MAGISTERIAL	EXPENDITURE	HDI	POVERTY GAP	Interv/Capita	Exp/Capita (Rand)
ALBERTON	30000	0.5348	0.0738	0.0038	0.08
BENONI	121115	0.5239	0.0417	0.1720	0.39
BOKSBURG	2635	0.5783	0.0142	0.0106	0.13
BRAKPAN	164335	0.5147	0.0215	0.1406	1.17
BRONKHORSTSPRUIT	4256	0.3404	0.0096	0.0077	0.10
GERMISTON	40545	0.5155	0.0125	0.0289	0.22
HEIDELBERG	15501	0.4114	0.0237	0.0105	0.19
JOHANNESBURG	110057	0.5771	0.2429	0.0615	0.23
KEMPTON PARK	38405	0.5697	0.0398	0.0227	0.10
KRUGERSDORP	0	0.5072	0.0314	0.0067	N/A
NIGEL	18805	0.4638	0.0174	0.0078	0.19
OBERHOLZER	124964	0.5118	0.0186	0.0191	0.66
PRETORIA	132360	0.5079	0.0946	0.0177	0.18
RANDBURG	94534	0.5251	0.0395	0.0088	0.26
RANDFONTEIN	39829	0.4876	0.0201	0.0047	0.32
ROODEPOORT	0	0.5397	0.0208	0.0006	N/A
SPRINGS	26812	0.5482	0.0490	0.0290	0.16
VANDERBIJLPARK	358910	0.5252	0.0821	0.0307	0.77
VEREENIGING	79332	0.4803	0.0476	0.0463	0.30
WESTONARIA	69200	0.5028	0.0216	0.0150	0.40
WONDERBOOM	3025	0.5368	0.0385	0.0002	0.01
TOTAL	**1474620**			**0.0292**	**0.26**

If it is assumed that the interventions and the expenditure per capita should be theoretically related to the degree or extent of poverty in a particular magisterial district, then it would be expected that there should be a negative relationship between interventions per capita and the HDI, and a positive relationship between the expenditure per capita and the poverty gap.

Figure 3.5 shows there is no significant correlation between the interventions per capita and the Human Development Index (HDI – an index of broader socio-economic development) ($r = 0.113$, $p = 0.626$). (The relationship, although not significant, is in fact slightly positive.)

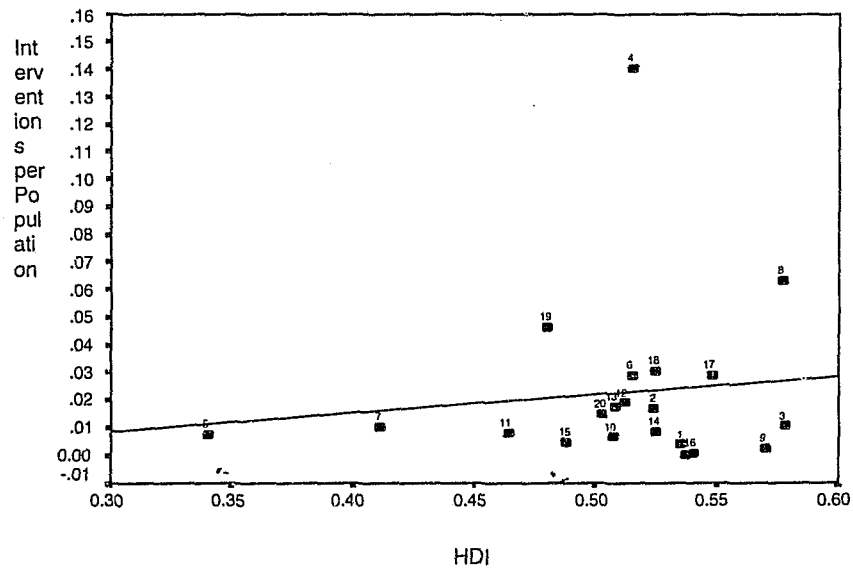


FIGURE 3.5 – CORRELATION BETWEEN INTERVENTIONS PER CAPITA AND THE HUMAN DEVELOPMENT INDEX, BY MAGISTERIAL DISTRICT IN GAUTENG FOR THE YEAR 1994/95

Figure 3.6 shows there is no significant correlation between the expenditure per capita and the poverty gap (an index reflecting the share per magisterial district of the theoretical minimum transfer needed eliminate poverty) (R = -

0.052, P = 0.832). (Although the relationship is not significant, it is in fact slightly negative.)

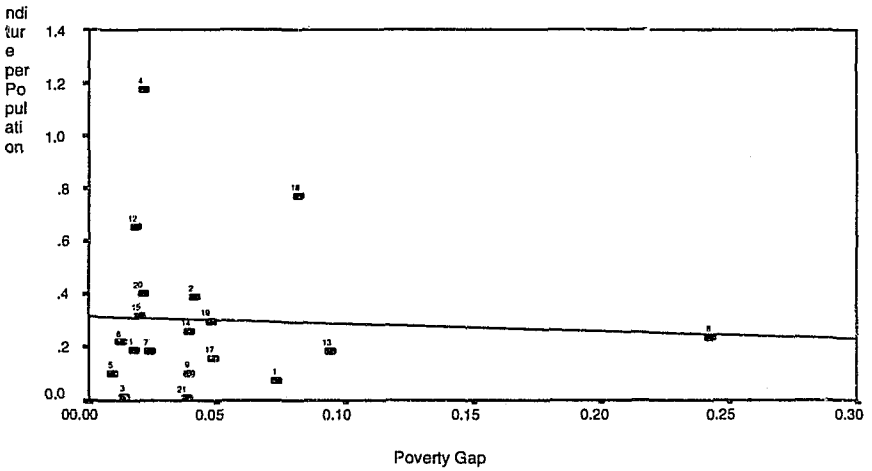


FIGURE 3.6 – CORRELATION BETWEEN EXPENDITURE PER CAPITA AND POVERTY GAP INDEX, BY MAGISTERIAL DISTRICT IN GAUTNEG FOR THE YEAR 1994/95

3.2 PROSPECTIVE STUDY

3.2.1 Description of study / sample population

Table 3.5 shows the numbers of questionnaires completed and the number finally analysed. After careful review of the 264 completed questionnaires, eight had to be excluded, one because the person with the child was not the habitual caregiver and could not answer the questions, and 4 others because they were found to be over the age limit. In the remaining 3 cases, the interviewers had filled in duplicate questionnaires.

TABLE 3.5– STUDY SAMPLE INTERVIEWED AND ANALYSED, BY CLINICS. GAUTENG 1995

LOCAL NAUTHORITY		PROVINCIAL		TOTAL SAMPLE
Clinic 1	33 (37)	Clinic 1	116 (116)	256 analysed (264 interviewed)
Clinic 2	58 (59)	Clinic 2	49 (51)	
Total	91 (96)	Total	167 (168)	

The numbers finally analysed are tabulated; the numbers in parentheses reflect the number interviewed.

The characteristics of the study population were recorded with respect to age, the identity of the person answering the questions and the reason for attendance.

3.2.1.1 Age distribution

Table 3.6 shows the age distribution of the sample population. It can be seen

that the greatest proportion are infants aged 0-6 months followed by 7-12 months, with very few children over three years of age. There was no significant difference in the age distribution of the sample population between the two implementing authorities. ($\chi^2 = 1.90$, $p = 0.59$)

TABLE 3.6 – AGE DISTRIBUTION OF THE CLINIC SAMPLE, BY IMPLEMENTING AUTHORITY. GAUTENG 1995

AGE GROUP	LOCAL AUTHORITY		PROVINCIAL		TOTAL	
	No.	%	No.	%	No.	%
0-6 months	53	58.2	84	50.9	137	53.5
7-12 months	17	18.7	42	25.5	59	23.0
13-36 months	17	18.7	33	20.0	50	19.5
37-60 months	4	4.4	6	3.6	10	3.9
TOTAL	91	100	165	100	256	100

3.2.1.2Caregiver identity

Table 3.7 shows that in 84,7% of cases it was the mother who looked after the child. There was a significantly greater proportion of mothers as the primary caregiver at the provincial clinics, although the difference was not large.
($\chi^2 = 3.57$, $p = 0.0059$)

TABLE 3.7– IDENTITY OFCAREGIVER, BY IMPLEMENTING AUTHORITY. GAUTENG, 1995

	LOCAL AUTHORITY		PROVINCIAL		TOTAL	
	No.	%	No.	%	No.	%
Mother	74	81.3	148	89.7	222	86.7
Others	17	18.6	17	10.3	34	13.3
Total	91	100	165	100	256	100

3.2.1.3Reason for attendance

Table 3.8 shows that the majority of the children (81.6%) were brought for immunisation. This reflects the nature of the services offered by the clinics, in that they provide relatively little curative care. There was no significant difference in reason for attendance between the two implementing authorities ($\chi^2 = 2.36$, p=0.31)

TABLE 3.8 – REASON FOR ATTENDANCE, BY IMPLEMENTING AUTHORITY. GAUTENG, 1995

	LOCAL AUTHORITY		PROVINCIAL		TOTAL	
	No.	%	No.	%	No.	%
Illness	11	12.9	12	7.3	23	9.2
Immunisation	69	81.2	140	84.8	209	83.6
Weighing	5	5.9	13	7.9	18	7.2
TOTAL	85	100	165	100	256	100

3.2.2 Breast feeding

Of the 196 children under 1 year of age, records were complete for 195 of them. Table 3.9 shows that the majority (77.4%) were still being breast fed, while 44 (22.6 %) were not being breast fed. The percentage of infants not breast fed at the local authority clinics was greater than in the provincial clinics, although this difference was not quite significant ($\chi^2 = 3.79$, p=0.052)

TABLE 3.9 - CHILDREN UNDER 1 YEAR STILL BREAST FED, BY IMPLEMENTING AUTHORITY. GAUTENG, 1995

	LOCAL AUTHORITY		PROVINCIAL		TOTAL	
	No.	%	No.	%	No.	%
Breast feeding	48	69.6	103	81.7	151	77.4
Not breast feeding	21	30.4	23	18.3	44	22.6
Total	69	100	126	100	195	100

As seen in Table 3.10 , 46 (23.6%) said they had never been asked whether

they were breast feeding while 53 (27.2%) said they had never been told of the benefits of breast feeding. Of the 44 who were not breast feeding, 29 (65.9%) said no-one had ever explained to them that it was possible to re-start lactation (one of the criteria for supplementation).

TABLE 3.10 - MOTHERS' REPORTING OF BREAST FEEDING PROMOTION AT CLINIC, BY IMPLEMENTING AUTHORITY. GAUTENG, 1995.

	LOCAL AUTHORITY		PROVINCIAL		TOTAL	
	No.	%	No.	%	No.	%
Never asked if breast feeding	19/69	27.5	27/126	21.4	46/195	23.6
Benefits never explained	22/69	31.9	31/126	24.6	53/195	27.2
Re-lactation never explained	11/21	50.0	19/23	82.6	29/44	65.9

3.2.3 Growth monitoring

Table 3.11 shows that in only 60% of children was it possible to adequately assess growth, while in approximately 40% of children, the growth chart had incomplete data. In 20% of cases, this was due to the fact that, as the birth weight was not recorded and it was the infant's first visit, only one weight was plotted. There was no significant difference in the adequate and inadequate monitoring of growth between the implementing authorities (χ^2 = 0.30, p=0.55). However, illness as a reason for attendance was found to be significantly more common (9 47) amongst those children who were not weighed or whose weight was not plotted, than amongst the remainder of the sample (14/209) ((χ^2 = 7.27, p=0.0069, Fischers exact test, 1-tailed p=0.012).

TABLE 3.11 – PROCESS OF GROWTH MONITORING, BY IMPLEMENTING AUTHORITY. GAUTENG, 1995

	LOCAL AUTHORITY		PROVINCIAL		TOTAL	
	No.	%	No.	%	No.	%
No card	3	3.3	1	0.6	4	1.6
Not weighed	11	12.1	8	4.8	19	7.4
Not plotted	15	16.5	13	7.9	28	10.9
One weight only	15	16.5	40	24.2	55	21.5
Adequate	57	62.6	97	58.8	154	60.2
TOTAL	91	100	165	100	256	100

Table 3.12 shows for the 154 children where it was possible to interpret the growth chart, the proportional distribution of the type of curve as well as the number and percentage below the third percentile. The majority of the children seen (86.9%) were growing well, while 15 (13.1%) showed a flat or declining curve. Only 7 children (4.6%) were below the third percentile. There was no significant difference in the children showing good or poor growth between the implementing authorities ($\chi^2 = 0.88$, p=0.348).

TABLE 3.12 – RESULTS OF GROWTH MONITORING, BY IMPLEMENTING AUTHORITY. GAUTENG, 1995

	LOCAL AUTHORITY		PROVINCIAL		TOTAL	
	No.	%	No.	%	No.	%
Curve up	53	58.2	79	47.9	132	51.6
Curve flat	1	1.1	9	5.5	10	3.9
Curve down	0	0	5	3.0	5	1.9
W/A < 3rd pc	3	3.3	4	2.4	7	2.7
Chart incomplete	34	37.4	68	41.2	102	39.8
TOTAL	91	100	165	100	256	100

3.2.4 Children at risk

Table 3.13 shows the number of children whose anthropometric data or growth curve was such as to classify them as "at risk" or as a potential candidate for the PEM scheme, by category of risk as specified. Children with errors in the process of growth monitoring, in whom a definitive conclusion was not possible, were also reviewed in the light of the specified criteria. They classified as being "at risk" if their previous records were such as to clearly indicate the need for assessment (previous faltering or weight loss, or weight near to 3rd percentile on previous weighing).

TABLE 3.13- CHILDREN POTENTIALLY QUALIFYING FOR SUPPLEMENTATION IN 4 CLINICS IN GAUTENG, 1995

TYPE OF PROBLEM OR RISK	LOCAL AUTHORITY		PROVINCIAL		TOTAL	
	No.	%	No.	%	No.	%
Total potential beneficiaries	9	9.9	23	13.9	32	12.5
- Curve flat	1	1.1	9	5.5	10	3.9
- Curve down	0	0	5	3.0	5	2.0
- Error but risk	5	5.5	3	3.0	10	3.9
- W/A < 3rd PC	3	3.3	4	2.4	7	2.7
TOTAL SAMPLE	91	100	165	100	256	100

Through applying these criteria for admission to the PEM scheme, as well as the additional criteria outlined in the Methods for defining a child as "at risk", 32 of the 256 children (12.5%) were identified as potential beneficiaries of the scheme.

3.3 ACTUAL HEALTH WORKER RESPONSE

Actual intervention by the health workers in relation to each child was assessed according to 5 categories. The first was enrolment onto the PEM scheme to receive a supplement. The other four reflected the caregiver's understanding of the advice or instructions given by the health worker during the consultation just completed regarding the child's growth (no comment, growing well, growing poorly); and whether a return visit or other action was necessary (growing poorly, return for treatment of assessment).

Table 3.14 shows these five actual health worker response categories, according to whether the researcher considered these children to be potential beneficiaries or not at risk because their growth was normal.

Eight children were found to be on the PEM scheme without having been identified as potential beneficiaries. In the case of seven of these, the information on the growth charts and questionnaires clearly indicated that they either never met the entry criteria or were in violation of the exit criteria, in two cases over a period of 6 months. In the case of one child, there was insufficient data to make any assessment at all as the child had not been weighed for four months.

The commonest understanding of the health worker's comments or advice, mentioned by 116 (45%) of the caregivers, was that the health worker had made no comment about the growth of the child. Five of these children were considered to require supplementation. The child was understood to be "growing well" in 103 (40%) of cases, and in one of these supplementation was indicated. In a total of 10 cases, the caregiver had understood that the child was "growing poorly", but in only 5 of these was any f[illegible]mation given regarding follow up or further treatment.

TABLE 3.14 - ACTUAL HEALTH WORKER RESPONSE AS REPORTED BY CAREGIVER, IN 4 CLINICS IN GAUTENG, 1995

	LOCAL AUTHORITY		PROVINCE		TOTAL	
	Potential beneficiary	Normal growth	Potential beneficiary	. Normal growth	Potential beneficiary	Normal growth
PEM scheme	2	6	0	2	2	8
No comment	3 (+1*)	35	13 (+4*)	65	16	100
Growing well	2	35	5 (+1*)	61	7	96
Growing poorly	0 (+1*)	2 (+1*)	2	0	2	2
Poor growth, return or treat	1	0	2 **	3	3	3
No data	1	5	1	10	2	15
Total	9	83	23	141	32	224

(+ x*) = no also on or requiring supplementation)

** includes a child who was correctly referred to hospital.

Potential beneficiary = child considered by researcher to require supplementation or follow up

3.3.1 Comparison of ideal and actual responses in relation to potential beneficiaries

Table 3.15 shows the "ideal" response in relation to each potential beneficiary in the opinion of the researcher. This opinion was based on criteria specified in accordance with the PEM scheme criteria (see Methods). For the children whose growth charts were incomplete, the presence of other risk factors indicated that they should at least have been reviewed. Any child with a flat or declining weight curve over more than 2-3 months or with a weight-for-age below the 3rd percentile, who was not breast feeding and had not attended because of illness, was assigned by the researcher to the "Supplement indicated" group. Any child with a flat or declining weight curve over more than 2 -3 months or a weight-for-age below the 3rd percentile, but who was either breast feeding or ill or both, was assigned by the researcher to the "Review"

group.

TABLE 3.15 - IDEAL RESPONSE FOR POTENTIAL BENFICIARIES, IN 4 CLINICS IN GAUTENG, 1995

TYPE OF PROBLEM OR RISK	LOCAL AUTHORITY		PROVINCIAL		TOTAL	
	SUPPL'T INDICATED	REVIEW INDICATED	SUPPL'T INDICATED	REVIEW INDICATED	SUPPL'T INDICATED	REVIEW INDICATED
Curve flat	0	1	2	7	2	8
Curve down	0	0	0	5 *	0	5
Error/risk	0	5	0	5	0	10
$< 3^{HD}$ pc	2	1	3	1	5	2
TOTAL	2	7	5	18	7	25

* 1 child was identified as needing referral

A comparison of the ideal and the actual response for each child enabled the classification each PEM-related intervention as:

a correct intervention where the researcher assessment was matched by actual practice

a "missed" intervention where a child did not receive either a supplement nor was brought back for review (error of exclusion)

a "non-indicated" intervention where the child received either a supplement or a request to return for review, without the reason for such a course of action being apparent (error of inclusion)

In Table 3.16 it can be seen that, of the 32 children identified by the study as requiring a PEM scheme-related intervention, for only 6 of them (18.7%) was the response of the health worker correct, while 26 did not receive the support they needed. This reflects an 81.3% rate of exclusion error.

Conversely, 10 children received inappropriate interventions; a 3.9% inclusion error with respect to the total 256 children reviewed.

TABLE 3.16 - COMPARISON OF IDEAL AND ACTUAL RESPONSES FOR POTENTIAL BENEFICIARIES IN 4 CLINICS IN GAUTENG, 1995

	LOCAL AUHTORITY		PROVINCE		TOTAL		
	SUPPL INDICATED	REVIEW INDICATED	SUPPL INDICATED	REVIEW INDICATED	SUPPL INDICATED.	REVIEW INDICATED	TOTAL
CORRECT ACTION	2	1	0	3	2	4	8
EXCLUSION ERROR	0	6	5	15	5	21	26
INCLUSION ERROR	6	0	2	2	8	2	10

4 DISCUSSION

4.1 STATED OBJECTIVES AND CRITERIA OF THE PEM SCHEME

As one of the nutrition programmes run by the government, the PEM scheme had as its goal "to provide food supplementation in the form of specialised products to identified target groups". The guidelines state later on the same page that the scheme "is not a food programme but a nutrition support programme which is intended to treat PEM" (57).

The stated aims of the PEM Scheme are the early identification and treatment of children aged 0-6 years who are at risk of developing PEM. It also aims to cover the identification and treatment of children aged 0-6 years already suffering from PEM; and of pregnant or lactating mothers, the elderly or the chronically ill, who are either underweight or whose weight gain is unsatisfactory or who are at risk of becoming underweight. In addition, it includes any of the above with a vitamin and/or mineral deficiency. It specifically excludes children over six years of age, as well as those families whose problem is seen as purely socio-economic.

The entry and exit criteria are specified in terms of standard anthropometric indices: weight-for-age below the third percentile, or a failure to gain weight over 2-3 months. For infants aged 0-6 months, additional criteria are that they should not be breast feeding and that breast feeding cannot be re-initiated. (Weight for height or absolute weight is used for pregnant women).

These aims are to be achieved through the monthly distribution of approved food supplements, largely through the preventive and promotive clinics run by the local authorities. The supplements consist of either one of a range of breast milk substitutes, a commercial weaning porridge, or a "formulated food" in the form of a supplement (PVM – Protein-Vitamin-Mineral), which can be

provided as a powder or already mixed with maize meal. The documents mention the need to protect breastfeeding, as well as the need for "intensive nutrition education on the need for a diet which contains sufficient energy, high quality protein as well as adequate vitamins and minerals".

The analysis of the nutrition problem can therefore be assumed to be that underweight and growth faltering are the major problems and that there are several groups which are more affected. The key determining factors are seen as lack of food or deficiencies especially of proteins, vitamins and minerals, and ignorance of adequate diets; the appropriate mechanism for supplying the beneficiaries is through the clinic system and the appropriate intervention is a take-home individual supplement of a commercial or formulated food.

4.2 TARGET GROUPS AND TARGETING AS SHOWN IN ROUTINE DATA

On examining the information obtained from routine province-wide reporting, the very low numbers of interventions (and beneficiaries) is apparent, with only an estimated 9000 children in the critical age group of 7-36 months enrolled, in a population nearing 7 million. In some magisterial districts, the total interventions during a year do not exceed 200. Given that this is routine data, there is almost certainly underreporting and the results must be interpreted with caution. The situation with Johannesburg, where it was not possible to obtain data from one Local Authority, illustrates this.

However, some rough estimates can be made of the magnitude of the under-servicing. Assuming that 10% of children under 6 are underweight for their age and that this age group constitutes 15% of the population, then a minimum of 1.5% of the total population can be assumed to be underweight for age and therefore should probably be enrolled in the PEM scheme, according to the entry criteria. This would give a figure of approximately 100 000 beneficiaries, or 600 000 interventions for children aged 0-6 years,

including only those who are underweight and not accounting for growth faltering. If compared to the actual figure of just under 200 000 interventions, the extent of under-servicing becomes apparent.

The target groups as specified by the scheme are broad and numerous, and it is noticeable how varied the implementation is from one magisterial district to another. This may be partly due to the differing demographic and health profiles of each district, which reflect the impact of the enforced separation and discrimination of apartheid. This resulted in some of the richer (previously white) local authorities spending minimal amounts on improving the nutritional status of children, perhaps because the children in these areas did not need any intervention. This is borne out by routine data on growth monitoring, which, although very incomplete, suggests that in some local authorities only about 2% of children seen are underweight for age (59).

The age group 7-36 months has been clearly identified, both internationally (8,44) and locally (5) as the age during which growth faltering is most frequent. Although in percentage terms the focus on this group appears to be quite good, it only represents 28% of the total interventions. There are definite problems in one magisterial district with 70% of interventions in the 37-60 month age group when intervention is probably too late to make much impact. Stunting has already occurred by three years of age in the majority of cases and "catch up" growth is seldom seen (8). The fact that the provision of breast milk substitutes to infants under 6 months of age represents over 20% of interventions in a quarter of the magisterial districts is very worrying, although numbers are not large and overall make up only 9% of total interventions. It must be pointed out that the distribution of subsidised breast milk substitutes through health facilities constitutes a direct violation of the Code on the Marketing of Breast Milk Substitutes (58).

Expenditure per capita is not intended to reflect full programme costs, as it covers only the cost of the supplement and detailed information was not

available. It is recognised that the duration of supplementation as well as the relative proportions in each target group would impact on expenditure. However, some very rough estimates of costs allow us to compare the cost of supplementation with a breast milk substitute at between R60 and R120 per month, or of PVM at R5 per month, with the overall figure of R1.28 per beneficiary. This points towards a programme of questionable efficacy.

On analysing implementation and expenditure in relation to population, while the very low coverage is immediately apparent, what is even more striking is the variation between magisterial districts. There is undoubtedly some underreporting or underclaiming – the absence of data from two districts makes it clear that, although it might be expected that the Local Authorities would wish to recover expenditure incurred, this might not be done on an annual basis if the amounts are small. Variation could also be explained by differing degrees of need among magisterial districts, and in fact this should be apparent in a well-targeted programme, with more services and resources found in poorer districts where the number of needy children would be expected to be larger. However, no correlation was found between expenditure per capita and the Poverty Gap index, where there should have been a direct relationship indicating greater provision of supplements as the Poverty Gap index increases. There was also no relationship between the interventions per capita and the Human Development Index, where a negative correlation would have been expected given the assumed lesser need for nutritional support in magisterial districts with higher Human Development Indices.

The situation discernible through an analysis of the routine data therefore reveals a programme where policies are very variably implemented and where the completeness of reporting would need to be investigated. On the data available however, it appears that the targeting of interventions to beneficiaries does not adequately identify the needy, with the very low numbers pointing to a considerable number of errors of exclusion and a probable failure to meet the stated objectives of the programme in relation to

children.

4.3 SCREENING; OR THE IDENTIFICATION OF BENFICIARIES

The process whereby identification of beneficiaries takes place in the clinics was then examined in more depth in the small prospective study. The clinic sample cannot be taken as being representative of the province – convenience sampling of the implementing authorities was used and the sample was selected in relation only to the four clinics randomly selected from amongst the clinics in those two areas. The findings do however bear out those from the retrospective study of routine data, and illustrate the degree of exclusion of beneficiaries, although some errors of inclusion were also found. At one clinic it was not possible to reach the calculated sample size due to bad weather. Although this reduces the power of the study to demonstrate a difference between the clinics, this is not of major significance given the objectives of the study. Where differences were not shown, the p-values are very high and it is doubtful if, even with a slightly larger sample, a significant difference would have been shown.

Apart from the sampling aspect, the quality of the data was good. The interviewers were not health workers, which could have led to bias as caregivers tried to respond in the "correct" way. They had however worked as interviewers on previous health-related studies and were fairly familiar with this type of questionnaire. The questionnaire was very simple and close support and supervision ensured almost complete reporting. The technique of copying the growth chart for future analysis by the researcher avoided the problem of having to ask non-health professionals to effectively make an interpretation of the data in order to answer the questions, and ensured more reliable data.

The pilot had picked up that the study was impacting on specific health worker behaviour, and this was corrected through broadening the (apparent) scope of

the study through the addition of questions not related to the objectives of the study. The questionnaire therefore deliberately included an assessment of the immunisation record, as it was felt that this would be immediately apparent to the staff at the clinic who would understand that immunisation was the subject matter of the study. Although the presence of interviewers probably did affect the care provided, this would not have been solely in the area under review and would in any event have tended to improve the quality of care provided. Any findings with respect to quality of care provided can therefore be considered as a "best-case scenario".

The identification of potential beneficiaries for food supplementation is in effect a screening programme, with the screening test being the monitoring of growth in relation to certain criteria. A screening tool needs to fulfil certain requirements if it is to be adequate for this purpose. As previously stated in the Introduction, the coverage of the population must be as complete as possible in terms of regularity and number of contacts, without exclusion of the most needy; misclassification of those screened must be minimal; the costs of screening must be low when compared to the costs of indiscriminate intervention for all children; and effective action must follow for those identified as needing it (44,45). The study therefore used the data collected to assess the degree to which these requirements were met. (Many studies have raised concerns with the accuracy of the data plotted on growth charts (44). This aspect was not examined and might therefore add to the errors picked up.)

The coverage achieved in the use of a screening tool is of fundamental importance. If coverage is low or irregular, and particularly if the target group for the intervention is differentially excluded, then the objectives of the programme will be undermined through a systematic error of exclusion. The study found that just over half the children attending the clinics are under 6 months of age. While attendance was good up to one year of age due to the immunisation schedule with visits at 6,10 and 14 weeks and at 9 months; after 1 year it decreases significantly with only 23 3% of children aged 1-5 years. The usefulness of growth monitoring as a tool for screening is thus reduced

through its low coverage amongst part of the major target age group, namely children aged 1-3 years. The fact that over 80% stated they had come for immunisation confirms the role of the Expanded Immunisation Programme in ensuring attendance. Once the immunisation schedule is completed at 9 or 10 months of age, attendance drops off considerably among children perceived not to require health care unless ill (44).

Of critical relevance to an assessment of the screening programme are the findings in several community-based studies regarding the characteristics of attenders and non-attenders. In a study in South Africa the nutritional status of non-attenders was found to be significantly worse than that of attenders (47). In Zaire, the most at-risk children were found to attend the clinic significantly less often (48). Clinic attenders could therefore be described as a self-selected group, with the most needy children less likely to be seen and therefore screened.

A major influence on effective coverage was the very high percentage of errors found: in only 60% of children was the screening tool applied at all; in 40% it was not possible to assess the children through various errors in the growth monitoring process. As far as these latter children were concerned, their attendance at the clinics did not represent a screening contact. The effect of this would be similar to that of mothers not bringing their children for screening as it reduces the coverage of screening. Our analysis moreover demonstrated that the children attending for illness were significantly less likely to have been weighed, or if they were weighed, the weight was not plotted on the chart. (This was not due to mothers not bringing their cards - only 4 children (1,6%) did not have their cards with them.) While this study did not analyse whether any other specific action was taken by the health worker for these children, it is apparent that those children who, given the relationship between malnutrition and infection (3,19) should be considered the most at-risk nutritionally, were in fact not screened, even though they had presented themselves at the clinic.

Another problem found in the organisation and process of growth monitoring was the total lack of birth weight data plotted on the weight charts. This meant that in 56 children (20%) there was only one weight plotted on the weight chart, as the children were coming for their first visit. Given the importance of low birth weight as a predictor of high risk for both illness and subsequent malnutrition, this is a serious weakness in programme implementation and once again constitutes an effective reduction in the coverage of screening.

A further requirement for a screening tool is that it should not significantly misclassify those screened with respect to their status, in this case as well nourished or malnourished according to weight-for-age or growth faltering. While there was no attempt to ascertain the actual classification assigned by the health workers (this would have obviously constituted a major change in the procedures used by them and altered their behaviour) the study used the action taken by the health worker to deduce the classification assigned.

Of the 256 children, 32 (12.5%) were identified by the researcher as potential beneficiaries of the scheme. Only 7 children (2.7%) were found to be underweight on that visit, although this figure rises to 4.5% if only children whose weight charts were complete are included. The prevalence of underweight in Gauteng children is 9% (11) and this lower prevalence may reflect that this is a better off area or be due to the better nutritional status of clinic attenders described above (47,48).

Only one quarter of the children identified as potential beneficiaries were correctly managed (and identified) by the health workers. Fully three quarters (26 children) were misclassified as "normal" although they met the criteria for the PEM scheme. This reflects an error of exclusion, in that they did not receive a supplement that they needed (5 children), or were not requested to return for a review in order to take a decision on the need for a supplement (21 children). This type of misclassification has serious implications for the impact of the programme, as it represents a failure to reach the programme's

objective, namely the support of children at risk for malnutrition(21).

Eight other apparently normal children were receiving a supplement and therefore classified as "malnourished", which reflects an error of inclusion, as they did not meet the specified criteria. Errors of inclusion impact on resource use by increasing the costs of the programme without a concomitant increase in calories delivered to identified beneficiaries (21,33). The number of those wrongly enrolled here actually exceeds the number of identified beneficiaries for supplementation. If these findings were to be extrapolated to the magisterial district as a whole, and applied to the 8649 children under six reported as beneficiaries in the previous year within that magisterial district, one could estimate that roughly 6000 children were wrongly supplemented.

A good screening tool should result in an action or response that is more cost-effective than either indiscriminate treatment (without screening) or than no early treatment. This study did not attempt to look at this aspect and no concrete findings can be given. It is obvious however that a large amount of staff time is invested in the process of growth monitoring, not to mention the time cost to the mothers themselves. In some nutrition projects, the frequency of routine growth monitoring has been reduced to quarterly or even six-monthly (60). While the monitoring of growth brings benefits over and above simply screening for malnutrition, the opportunity cost involved in the monthly weighing of these infants under six months of age, where 77% are breast fed and over 80% show no signs of nutritional risk, must be noted. Conversely however, the number of potential beneficiaries is low and that of children with normal growth is high. Indiscriminate supplementation would therefore include roughly 85% of children who did not meet the criteria as specified.

Health worker intervention as a result of growth monitoring has been described above and is seen to be seriously deficient. The problem of health workers not responding adequately to manifest growth faltering or even underweight shown on growth charts is a common one world-wide and the

reasons for this are unclear. Reasons cited have ranged from a conceptual difficulty with graphs themselves (51), a difficulty in understanding the idea of "faltering" (48), and work overload and limited health worker skills and understanding of the required response (44,48). This study focuses on the aspect of identification of beneficiaries and did not directly measure or assess the reasons for the nursing staff not responding appropriately.

This study did however examine some aspects related to the promotion of breastfeeding which is widely recognised as perhaps the single most important nutrition intervention for young children (16). Some comments on the degree of disjuncture between the stated aims and policies of health services in relation to childhood growth and actual practice can be made in this regard. The fact that 77% of mothers of children under 1 year were still breast feeding can be seen as a positive finding, although conversely it might be noted that almost a quarter of all babies were not being breast fed at one year of age. However, 24% of mothers stated that they had never been asked if they were breast feeding and 27% stated that no-one had ever explained the benefits of breast feeding to them. This reflects that a quarter of the mothers recalled no clear message regarding the most critical nutritional and health intervention for their baby, from the health facility providing them with preventive and promotive health care.

In summary therefore, one can conclude that the situation found in the clinics reveals some of the reasons for the very low coverage seen in the routine data. In the first place, it is clear that those children at the greatest nutritional risk are not attending the clinics – while one quarter are aged 7-12 months, under one fifth are in the 1-3 year age group, and the prevalence of underweight detected was only 2%. Secondly, errors in the process of monitoring the growth of over one third of the children effectively reduced the coverage even further, with more inadequate assessments among sick children at high risk. Misclassification (as defined by health worker response) showed errors of exclusion of the order of 75%, when compared to the researcher's analysis. There were in addition errors of inclusion which, though

a relatively small number in relation to the total sample, exceeded the number of needy beneficiaries identified by the researcher. Critical aspects of the expected educational and promotional interventions were either not carried out at all or were not understood by the caregivers.

4.4 IMPLICATIONS OF THE STUDY FOR NUTRITION PROGRAMMES

Relating these findings to a broader discussion of the problem of childhood malnutrition and its solutions is required if any useful recommendations are to be forthcoming. Particularly given the complex and locally specific nature of the determinants of this problem in any community, a starting point for any nutrition policy and programme needs to be based on a clear understanding of what the problem is. The objectives or desired outcomes of the programme need to stem from an understanding of the problem, and decisions on appropriate interventions and targeting of these (including the screening process) would be a subsequent step in programme planning. The types of decisions based on this information have been conceptualised as "macro" and "micro" – that is, the types of broad policy decisions, which create an enabling framework and the resources it needs, as distinct from the local level decisions on appropriate strategies for that community (60).

In considering the problem in South Africa, it is apparent that the critical problem is that of stunting, with underweight assuming a lesser significance (5,10,11). Growth retardation or faltering, which starts at about 6 months of age when weaning commences, is recognised as the immediate cause of stunting. By the age of three years, the linear deficit which is manifest as a low height for age has been established. Subsequent linear growth has been found to be comparable with that of non-stunted children, although the initial deficit is seldom wholly made good (8). The PEM scheme does include growth faltering as a criterion for enrolment, but the number of target groups is so large that the essential focus on the most vulnerable group and that where intervention is most effective, is lost.

Although it seems that after 3 years of age an increase in mortality risk is found only with very severe deficits, the long term functional significance of stunting is becoming clearer in terms of a demonstrable reduction in physical work capacity and possibly productivity, and a higher incidence of low birth weight and of obstructed labour. The inverse relationship of stunting with cognitive development and intellectual capacity seems to be influenced by the co-existence of critical factors such as parental education and attitudes and the psycho-social environment, which are associated with the poverty and deprivation which impair both growth and cognitive development. The conclusion therefore seems to be that, rather than small size being a problem in itself, it is a risk marker for certain critical outcomes, but that the process of ensuring healthy growth will by its nature also contribute to healthy development (8). Knowledge of this link needs to impact on nutrition programming, health worker interventions and community and household practice, in order to contribute to the healthy development and long term capacity of children.

The underlying causes of growth faltering are complex and not fully understood, probably because they are very context-specific (1,3,8,60). Many studies have identified the importance of care and feeding practices particularly in relation to breast feeding and weaning, and interventions which successfully impact on this aspect seem consistently to achieve the best outcomes (20,41). However, the concrete situation and constraints on implementation of "best practices" at the household level have to be understood and incorporated if behaviour change is to become a reality. The identification of at-risk families where adequate care is unlikely to be easily ensured would seem to be a critical point of departure for programme planning.

Although the long term impact of improved case management of childhood illness on long term nutritional status has been questioned(20), the importance of adequate feeding both during and after illness is clear. The fact that ill children or those recovering from illness are likely to be at risk also

needs to be taken into account, and illness constitutes an important precipitating factor for an acute worsening of a child's nutritional status. This is borne out by the fact that approximately one third of the admissions to the Paediatric wards at Chris Hani Baragwanath Hospital were found to be underweight for age, and children recently discharged from hospital should constitute a specific at-risk group(9). The clinical use of the growth record to evaluate the general state of health and the presence of underlying chronic disease should not be forgotten as it is both important and feasible in our setting. The fragmentation of services into preventive and curative is a major barrier to this approach and needs to be overcome.

An understanding of the degree to which a lack of food is the problem requires and analysis of what leads to this situation in certain families. The co-existence of undernutrition in children and obesity in adults in the same family highlights the need for this analysis. What is needed is a clearer way to identify the types of families where there is an absolute lack of food, to the point where even the small amount needed by a child is not available; as opposed to the situation where feeding practices are the most important factor. This would guide the use of food supplements for children.

Growth monitoring, with a specific focus on growth faltering in children under three, still appears to be the best mechanism to screen for at-risk children and to guide interventions to support them. However, the focus must shift to an educational and promotional approach, which addresses the multiple and complex determinants of faltering. A better understanding of the significance of faltering and of the locally specific causes needs to be built into staff training.

Reaching the most vulnerable will require an attitude shift within health facilities. Nurses will need to recognise that women's time is possibly their most precious resource, and that in primary level child health care, health workers' attitudes to their clients are as important as their technical

competence. In particular, service organisation and clinical guidelines must effectively implement an "at-risk" approach. Alternative strategies such as community-based growth monitoring may be of far more use in reaching the most vulnerable mothers and their children, and the use of sub-professional or even voluntary workers may in the end provide a much better supportive service to them than relying on overworked professionals (44,45).

5 RECOMMENDATIONS:

This review of aspects of the targeting of the PEM scheme identified low coverage in relation to the critical target group of children 7-36 months, with a significant number of errors of exclusion as well as inclusion in the identification of beneficiaries. In addition, health worker response was found to be inadequate and did not address the promotion of adequate nutrition. Recommendations are based on these findings as well as international best practice in this field, and address firstly the provision of services through health facilities, followed by interventions at a community level. Lessons for monitoring and evaluation of services are then covered, and recommendations relating to some broader policy and programme issues complete the study.

5.1 IN RELATION TO SCREENING AND SUPPLEMENTATION WITHIN HEALTH SERVICES

The very low coverage of this programme needs to be addressed if it is to have any impact on the problem of childhood malnutrition. Access to screening and intervention within health services should be facilitated for the identified target group, notably children aged 1-3 years and especially the most vulnerable among them. An at-risk approach should inform the organisation of services and the clinical protocols used, addressing also such issues as queuing time and the communication skills of staff.

A significant amount of staff time is invested in attending to normal children who are growing well. Routine care for children not at risk (healthy, gaining weight, breast fed) should be carefully reviewed and time and resource use tailored to become more cost-effective. This would include reducing the frequency of visits for normal children in order to free resources to better support children at risk.

The study reflected the legacy of the fragmentation of services for children into preventive and curative care, which contributes to inadequate screening and care for those children most at risk. This must be overcome, with an integrated approach to the monitoring of growth, the identification and management of all sick children or children at risk, and the promotion of sound nutrition and feeding practices, wherever children are attended.

The major deficiencies in the quality of growth monitoring and its use as a screening and educational tool, stemming in part from inadequate policies and guidelines, must be addressed. The quality of care provided should be improved through ongoing training and assessment of staff (see below) and the provision of clear and appropriate guidelines and supportive supervision. It is particularly important that staff have a better understanding of the significance of growth faltering as a risk marker for a range of future outcomes and of the determinants of this inadequate growth and development. Training methodologies need to be devised that would enhance the positive and problem-solving attitudes of health workers.

5.2 IN RELATION TO COMMUNITY-BASED INITIATIVES

A purely facility-based approach will probably never solve the low coverage amongst the most at-risk, nor will supplementation alone resolve the nutrition problem. A focus on the nutrition, health and care of young children, with growth monitoring as a tool where feasible, should be integrated into existing or planned community-based projects that reach the target group, especially those who would otherwise not be reached. These should include projects initiated by the departments of Welfare, Education, Agriculture and Public Works as well as by the Department of Health.

Micro-level problem definition and problem solving should lead to the identification of locally appropriate solutions as part of a broad developmental approach. Projects should be run by NGOs and CBOs, with support from

local leaders as well as from relevant line departments and referral to their services as required. "Extension" staff with the necessary skills and support, probably at the auxiliary level, will be essential.

Information gathered from such projects should be fed back to service providers to aid them in understanding and identifying which are the families and children most at risk – where "care" for children is severely compromised or where access to food is a problem.

Existing mechanisms for advocacy and co-operation should be identified and strengthened to ensure involvement and avoid the duplication and lack of co-ordination which can lead to wasted resources (both money and time) in such efforts.

5.3 IN RELATION TO MONITORING OF IMPLEMENTATION

This study has shown how much can be deduced from routine data. This data should be more carefully tailored to program objectives and used regularly to guide program implementation and allocation decisions such as targeting. Useful indicators can be tracked through the linkage of routine data sets, for example an estimate of service coverage through relating population to health facility data, or of unit cost through linking expenditure to outputs. Indicators at this level identify a problem and highlight areas requiring further investigation. Regular feedback to local authorities regarding progress or the lack of it would improve data collection.

Exit interviews have been widely and successfully used to evaluate the extended program on immunisation and could equally be used to assess the quality of growth monitoring. Health workers can use such information, (or that from simple record reviews,) to become more aware of the kinds of errors that compromise growth monitoring and child health programs within their

facilities. With simple protocols such as this one, participatory evaluation can empower and encourage staff to improve the quality of care as well as their own job satisfaction.

5.4 IN RELATION TO POLICIY AND PROGRAMME DEVELOPMENT

Policy development and programme design needs to be reviewed in accordance with better information on the nutrition problem and its causes, as well as the vulnerable groups affected. This would enable the development of a broad and enabling framework, within which a range of possible technological inputs or strategies would be available as a "menu of options" in accordance with the needs of specific local situations or contexts.

A fundamental question is the extent to which inadequate access to food at the level of the household is a factor in childhood malnutrition and under which circumstances. Food supplementation for children would form part of a food support programme if a lack of food impacting on the intake of young children is found to be a problem. This must however be part of a broader approach to supporting young children during the critical 0-3 years period, together with measures which not only encourage but also enable women to breast feed their children.

Further locally specific information is needed to allow us to identify the most vulnerable families, and understand their child care practices and arrangements. Ways of supporting such families could then be developed locally. What are needed are accessible and replicable methods for collecting, analysing and disseminating such information and guiding its application to the programme as a whole. Information and communication strategies for example, including social marketing and nutrition education in health care settings, could be based on carefully targeted and appropriate messages identified at this level.

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Appendix 1"Local Authorities"

Local Authorities
Akasia
Atteridgeville
Alberton
Alexandra
Benoni
Boksburg
Brakpan
Bronkhorstspruit
Carletonville
Diepmeadow
Ennerdale
Germiston
Heidelberg
Johannesburg
Kemptonpark
Kagiso
Krugersdorp
Lenasia South
Natalspruit Hosp
Meyerton
Midrand
Nigel
Pretoria
Randburg
Randfontein
Randvaal
Rayton
Roodepoort
Soweto
Springs
Vanderbijlpark
Vereeniging
Verwoerdburg
Vosloorus
Westonaria

Name of interviewer _____ Clinic _____

Time started _____ Date _____

EXIT INTERVIEW TO CAREGIVERS OF ALL CHILDREN 0-6 YEARS

(DATA COLLECTION TOOL NO.2)

Is your child over 6 years of age?
Dilimo tsa nqwana dikae?

If over 6 years, OUT.
If under 6 years, continue with interview.

1. Are you the person who ususally looks after the child?

   Kewena muthu ohlokomelang nqwana?

YES	NO
X	

2. What relationship do you have to him / her?
   Le amana njwang leyena?

2.1 mother
2.2 grandmother
2.3 other (specify _____)

2

3. For what services or reasons did you bring your child to the clinic? (can answer more than one).
   Lebaka le uhlulang kalona clinic?

3.1 growth monitoring
3.2 immunisation
3.3 illness / treatment
3.4 other (specify)_____

3

If not for illness / treatment, skip to 7:

If brought for illness or treatment (3.3):

4. If the child is ill, what symptom(s) led you to bring the child here?
   Yaebo nqwana uwakula ubone kayingi?

   _____

   _____

5. How long has the child been ill for?
   Unali nako ekae nqwana akula?

5.1 < 2 days
5.2 >2 days but < 1 week
5.3 > 1 week

1

6. What treatment were you given?
Bahufilong, mabapi lesukula?

6.1 advice
6.2 medicines
6.3 referral
6.4 other (specify) _____

7. Do you have the child's weight chart with you?
Unaliyona weight chart howena?
IF No, OUT

YES | NO

If yes:
Yabe o:

8. (Verify the child's exact age today from the chart)

8.1 Date of birth _____ (copy)
Tsatsi la tsalo

8.2 Age today _____ years _____ months (calculate)
Lilimo kajeku bijora dikgedi
(IF >6 years OUT)

FOR CHILDREN 0-12 MONTHS OF AGE:

9. Has anyone at the clinic ever asked if you are breast feeding?

YES | NO

N
Honali muthu wa clinic okile abutsa hore wa a tsa na?

10. Has anyone at the clinic ever explained the importance of breast feeding to you?
Bakile bahlalusa buhlokwa bahu antsa?

YES | NO

11. Is your baby breast fed?
Ngwana wa anya na?

YES | NO

If Yes, breast fed:
Ha ebe o:

12. How many times per day:
U anya hakae?

12.1 1-3 times
12.2 >3 times
12.3 whenever the baby wants

Skip to 17.

If not breast fed:
Ha obe ha anyi:

13. How old was the baby when you stopped breast feeding?
Une alidilimo tse kayi ngwana ha ahlohela hu anya?

13.1 <1 month
13.2 1-3 months
13.3 4-6 months

14. What was the reason for stopping breast feeding?
Lebaka lawawu lawumu hluhedisa kilipeng?

14.1 mother absent/dead
14.2 mother with mental problems
14.3 mother with medical problems
14.4 mother working
14.5 other (specify) .....

COMMENTS (anything else the mother may say about breast feeding)

15. Has anyone at the clinic enquired why you are not breast feeding?
Huna limuthu clinic okile abutsa? YES | NO

16. Has anyone at the clinic ever told you that you might be able to start breast feeding again?
Makilo bajwetsa hure ukane waqala haphe? YES | NO

FOR ALL CHILDREN

17. Was your child weighed today? YES | NO

If no, skip to 19.

If yes:

18. What did clinic staff say to you today about your child's growth? (probe if necessary)
Ba etsong kahuhula wangwana?

18.1 did *not* say anything about growth of your child
ababuwa litho kawu wa la
18.2 growing well
uhula hanhle
18.3 growing poorly; no other comments
uhula hampi
18.4 growing poorly; return in 1-2 weeks
uhula hampi gutla kamra 1-2 diboke
18.5 growing poorly; treatment or referral
uhula hampi uhloka tsebetso kapho hwathi uyongengi
18.6 other .....
hohung

19. Were you told to come and fetch a parcel of milk or food from the clinic? [YES | NO]

Bakile bari uholata parcels?

20. If yes, what was the reason you were given for having to fetch the milk or food?
Ya obe e lobaka ene elelefeng?

21. COPY THEIR IMMUNISATION RECORD FROM THE CARD:

EVENT	AGE	DATE GIVEN	
BCG			
Polio 0			
Polio 1			
Polio 2			
Polio 3			
DPT 1			
DPT 2			
DPT 3			
Hepatitis B			
Measles			
Other (_____)			
Booster			

22. COPY THEIR WEIGHT CHART ONTO THE CHART ATTACHED

Growth Chart

BIRTH – 1 YEAR

2 TO 2½ YEARS

2½ TO 7 YEARS

SUBJECT INFORMATION AND CONSENT FORM - EXIT INTERVIEW

I am _____ from the University of Witwatersrand.
We are looking at some aspects of the services which clinics offer to children in this area,in order for the new health department to know what to improve from the informatoin we get from you.

//I would like to find out from you about today's visit. It will take about 10 minutes. I would like to ask you a few questions and look at your child's growth card if you have with you.

I am not going to write your name or your child's name so noone will know who answered the questions and you are free not to participate, if at any time you feel uncomfortable with the questionare I will stop the study.

TRANSLATED TO ZULU

Mina ngingu _____ ngisebenza e Wits University.
Sibhekana nosizo amaclinic asiza ngalo abantwana kulendawo,ukuze abezempilo bazi ukuba banga phucula kanjani ngolwazi esizolithola kuwe.

Ngizokubuza kancane nje ngokuza kwakho lapha eclinic namhlanje. Kuzothatha imizuzu eyi 10. Ngizokubuza imibuzo ngibheke nekhadi lesikali uma uliphethe.

Angeke ngibhale igama lakho ne lomntwana ngakhoke akekho ozokwazi ukuthi ubani ebe phendula lemibuzo,uma ungafisi ukuphendula uvunyelwe akuphoqelelwe muntu noma mhlawumbe awusafuni ukuqhubeka nokubuzwa ngizo yeka ukukubuza.

Author Marshall C A
Name of thesis An Evaluation Of Aspects Of The Pem (Protein Energy Mulnutrition) Scheme For Mulnourished Children In Gauteng Province Marshall C A 1998

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