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Social and dietary practices of Soweto families who protect agains overt malnutrition in their children

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2.2.3 Growth

The exact relationship between nutrition and physical growth is surrounded by controversy (Barba, Guthrie and Guthrie, 1982; Walker, Jones, Walker et al, 1983). The rate of growth and the final height achieved are influenced by genetic, emotional and nutritional factors, but the inter-relationships between these factors is unclear (Boulton, 1981). While it is impossible to distinguish any single one of these factors as being more important than the others, the association between nutrition and growth has been well established (Hansen, Freesman, Moodie and Evans, 1971; PATH, 1983; Hitchcok, Gracie and Owles, 1981; Barba, Guthrie and Guthrie, 1982; Church and Stanfield, 1971; Morley and Woodland, 1979).

Prolonged malnutrition is likely to stunt growth even though some children may make a complete physical recovery and reach international growth standards in weight and height. The permanence of growth retardation depends on the severity and duration of the malnutrition (Keet, Moodie, Wittmann and Hansen, 1971).

2.2.4 Intellectual and Emotional Development

The relationship between malnutrition and cognitive/behavioural development has been widely investigated (Stoch and Smythe, 1963; 1967; 1976; Yatkin and McLaren, 1970; Yatkin, McLaren, Kanawati and Sabbagh, 1971; Dobbing, 1972; Warren, 1973; Ashem and Jones, 1978; Evans, Bowie, Hansen et al, 1980).

The findings of two well-recognised South African studies (on the association between intellectual development and nutrition) have been summarised by Molteno, Kibel and Roberts (1986:51):

> Stoch and Smythe (1976) followed marasmic children from infancy until early adult life and Evans, Bowie, Hansen et al (1980) reported on the outcome of children with Kwashiorkor. These studies, and others from other parts of the developing world, indicate that cognitive development is significantly impaired in marasmic children but not in those with Kwashiorkor. This is probably because marasmus has its onset during a period of rapid brain growth and is usually more chronic than Kwashiorkor. Gross pathological malnutrition is generally accepted as

> being detrimental to the [intellectual] developmental progress of the young child (i.e. changes involving motor, language, conceptual, emotional, or social skills and behaviour).

Malnourished children may be retarded in development, because they tend to suffer apathy which prevents them from playing and learning. This retardation can be reversed, though, "by treating the malnutrition and then providing maximum stimulation" (Professor John Hansen, The Star newspaper, 13 May 1985).

2.2.5 Social and Economic Development

A large number of malnutrition survivors continue to function in suboptimal ways (physically and/or intellectually) which is likely to result in poor psychosocial adaptation (Keet, Moodie, Wittmann and Hansen, 1971; Cravioto and DeLicardie, 1973b; Moodie, 1982). Furthermore, survivors tend to perpetuate the pattern of suboptimal functioning by finding mates of similar characteristics (Moodie, 1982). Survivors who suffer long-term effects of malnutrition are likely to be limited in their ability to be "incorporated into the socio-economic development of the country" (Keet, Moodie, Wittmann and Hansen 1971:1448).

2.3 Assessing PEM

The various means of assessing nutritional status include accurate measurements of:

(i) weight-for-age;
(ii) height-for-age;
(iii) weight-for-height;
(iv) skinfolds;
(v) arm circumference; and
(vi) head circumference

Measurements are related to reference standards (usually in the form of charts) which have cut-off points indicating the individual's nutritional status (Jellife, 1966; World Health Organisation, 1978; Morley and Woodland, 1979). For instance, a growth chart may be a weight-for-age graph:

> With the vertical axis representing weight and the horizontal axis representing age in months. A number of curves are printed on the graph representing reference standards. These curves may be percentages of the median of the reference population; for example the 'marasmus line' which indicates 60% of the median, or percentiles, for example the third percentile indicating for all ages the weight below which 3% of the reference population are found (de Vries, 1984:2).

There are separate charts for boys and girls.

Two of the major reference standards, currently being used in South Africa, are the Harvard reference standards (Wellcome Classification/ Boston percentiles) and the National Centre for Health Statistics (NCHS) percentiles. The Boston percentiles were used in the present study as they were used by Baragwanath Hospital and the Soweto polyclinics, from where the sample was drawn. Although Hamill, Drizd, Johnson et al (1979) favour NCHS percentiles and have criticised Boston percentiles as being derived from relatively small, biased study samples, Hansen (1984:1) states that "there is very little difference of practical significance between the two reference standards". For further discussion see section 4.2.

Weight-for-age measurements were used in the present study. Weight-for-age is considered to be one of the "strongest discriminants of mortality and morbidity risk, whereas weight-for-height is the weakest. Low height-for-age is an indicator of prolonged malnutrition" (Hansen, 1984:2). The presence of malnutrition, rather than its duration, was the basis of the present study and thus weight-for-height measurements were not considered.

According to the Boston reference levels, children who weighed less than 80% of their expected weight-for-age (i.e. less than the third percentile) are suffering from PEM. de Vries (1984:16) notes that "Morley and Woodland (1979) caution that not all children below the third percentile are malnourished as, by definition 3% of normal, healthy children are in this area". This was acknowledged in the present study and children below the third percentile were included only if they had overt signs and symptoms of PEM such as oedema, flaking skin, mottled teeth, bleeding gums and dull, discoloured and sparsely distributed hair (Jellife, 1966).

Chapter 3. Soweto: The Setting for the Study

Much has been written about Soweto, yet all aspects of the township and the life within it cannot be captured on paper. This chapter thus serves to provide a brief overview of Soweto, the setting of the study: Soweto, filled with culture, poetry, art, music, soul, laughter, tears, pain, conflict, suffering, struggles and hunger ... for basic human rights.

> Soweto is one of the world's greatest slum clearance schemes of the post-war era.
>
> Johannesburg City Council, 1973
>
> Soweto is a dormitory for people who mostly work in Johannesburg.
>
> Mandy, 1984
>
> Soweto the vital, the vibrant, the violent. A very strange community of contrasts, Soweto is dynamic, fearful, overcrowded, amoral, religious and superstitious. You can call it all these things and more ...
>
> Magubane and Lee, 1978

3.1 Historical Background

South Africa has many of the features of a Third World country – massive urban migration and rural underdevelopment, coupled with a capital-intensive manufacturing sector dominated by First World technology (Pinnock, 1981). The majority of South Africans are Black workers. They are a mass of unorganised people who have no power over the elite White oligarchy who rule the country. To further their own interests, the White rulers manipulate the Black workers and exploit their labour. The Whites determine all major policies through their control over the economic, military, legislative and political institutions. Included in their policies is an emphasis on separate development and apartheid which is based on a racist ideology (For a detailed analysis of South African Society see

Johnstone, 1976, 1979; Edwards, 1978; Wilson and Thompson, 1969; De Kiewiet, 1957; Heller, 1969; Roux, 1966).

Soweto, an acronym for South Western Township, is South Africa's largest urban Black settlement. It is an example of and typifies the urban Black township. It is a low income, high density residential area. Soweto is in fact Johannesburg's ghetto ... "that segregated place on the outskirts where Blacks are required to live" (Mandy, 1984:173). The development of Soweto began with the discovery of gold in 1886 when the first Black miners formed squatter settlements in the area. At the time of the present study, the growth of Soweto was marked by three major historical trends, identified by Morris (1980) in terms of significant political and administrative changes with regard to the status of urban Blacks in general and of Sowetans in particular. Morris (1980:2) describes these as:

- the entrenchment of the principle of impermanence under the terms of the 1923 Native (Urban Areas) Act;
- an increasing emphasis after 1948 on the impermanent status of urban Blacks in accordance with the policy of Separate Development; and
- it would appear that a third trend has been established, namely an apparent acceptance of permanence of at least some Blacks in urban areas, modified by a continued insistence on elements of Homeland policy.

In 1986, after the present study was completed, urban blacks were granted full home ownership rights by the State. However, few Soweto residents are in the financial position to take advantage of this.

3.2 Geography: The Physical Structure

Soweto is situated in the north-east of South Africa, in the highveld, some 15 kilometres south-west of Johannesburg (see maps in appendix C and D). It has a land mass of about 70 square kilometres, most of which is owned by the State (Berlin, 1978; Johnson & Magubane, 1979; Mandy, 1984). Until 1986, there was no property market, only 99-year leaseholds, and thus there has been little individual or public incentive to develop the land, much of which is underutilised. Soweto has "none of the components normally found in a

city of its size, ie. it has no town centre, no employment areas and apart from a large number of small scattered shops, no commercial or shopping nodes" (Morris, 1980:255). Due to the far daily distances to be travelled to and from their places of employment, Sowetans have high transport costs and lengthy hours of commuting. Furthermore, the prices of goods at shops in Soweto are usually higher than the competitive consumer controlled prices at supermarkets in Johannesburg.

There are 100 000 three- or four-roomed sub-economic houses in Soweto, hundreds of tin shacks and men only hostels for more than 75 000 migrant workers (Johnson & Magubane, 1979; Mandy, 1984). This accommodation is inadequate for the population of Soweto, both in quantity and quality, so there is great overcrowding and insufficient shelter from nature's elements (South African Institute of Race Relations, 1984). According to the Human Awareness Programme (1985), there are at least 42 000 families on the waiting list for houses, and there is an average of ten people per house in Soweto.

The land characteristics of Soweto are marked by water and sewerage facilities that are in poor condition and unable to cope with present demands; roads that are untarred, dusty, potholed and flooded during heavy rainfall; few green lawns, flowers and trees; and an inadequate electricity supply where:

> Eighty thousand houses in Greater Soweto have no electricity at all. Smog from one hundred thousand coal stoves hangs over Soweto all year round, intensifying to a sombre choking blanket in the winter months. Electrification would mean cleaner air, illumination to facilitate reading and studies, refrigeration for food storage and a great saving in time and labour. (Mandy 1984:210)

It is clear that Soweto has never been planned as an integrated unit. In fact, Soweto has been laid out haphazardly "in response to housing crises or population resettlements" (Morris, 1980:255).

The climate is temperate (the annual temperature averages about 16 Degrees Celcius) with a summer rainy season (December through February).

Berlin (1978) explains that the summer rainy season is an important factor from a health status perspective as the rains bring an increase in gastro-enteritis. In paraphrasing Scrimshaw, Taylor and Gordon (1968), Berlin (1978:13) states that "such seasonal complaints are

reflected in hospital (and clinic) admissions for our target population since the fever, nutrient loss and dehydration accompanying gastro-enteritis can trigger an overt nutritional crisis in marginally nourished children."

3.3 Demography: The People

Soweto has a population estimated to be close on two million people, although "only one million of these are recorded on the Government census" (Johnson & Magubane, 1979:9). According to Morris (1980), 30% of these people are considered to be living in the area 'illegally'.

The population of Soweto is comprised of several ethno-linguistic groups, the major representations being Zulu and Sotho with smaller numbers of Xhosa, Swazi, Pedi, Tswana, Ndebele, Venda and Shangaan (West, 1975, 1976). Residential areas in Soweto constitute tribal mixtures where tribal intermarriage is common, except amongst the Venda and Shangaans. (Berlin, 1978:13).

Morris (1980) argues that (1) with the high mix of ethnic groups; (2) at least 96% of Soweto's adult population having lived there for 20 years; and (3) the relative immobility of its population (due to legal and administrative restrictions), Soweto is becoming more and more urbanised and Sowetans are developing their own urban identity. West (1976:180) confirms this: "a new society is emerging ... which has been spurred on by the fast growing Black Consciousness movement that itself is dedicated to political liberation rather than to attempt to recreate a cultural past."

The population structure of Soweto reveals a balanced sex ratio, but indicates that families and households are generally younger and larger than those in other Metropolitan race groups (Morris, 1980).

3.4 Socio-Economic and Political Characteristics

Indicators such as income levels, level of education and health status reflect that the overall socio-economic status of Soweto is "low compared with White and other race groups in

the Metropolitan Region" (Morris, 1980:256). Although there is a considerable variety of employment and educational levels, ranging from "unskilled labourers to highly professional men and women" (Hellman, 1971:7), a survey in 1974 by the South African Institute of Race Relations found that 55% of Soweto households were living below the poverty datum line (Berlin, 1978). Unemployment levels have continued to rise and at the time of the present study, there were a number of adverse factors affecting the economy (South African Institute of Race Relations, 1985). Dr Gerhard de Kock, governor of the South African Reserve Bank, cited these in the Financial Mail 24 October 1984 as:

- the serious drought since 1982;
- sharp fluctuations in the price of gold;
- the effects of the business cycle in the industrial countries; and
- expectations that the dollar price of non-gold exports would not rise as much during the present upswing as it had in the past.

The government's response to these factors was to implement a set of monetary and fiscal policies (ie, to clamp down on the economy) which consequently aggravated unemployment and social unrest (South African Institute of Race Relations, 1985). As Desmond Loch Davies, Chairman of the Southern Life Association, stated in the Rand Daily Mail 5 November 1984: "Increasing the numbers of dissatisfied youths on the street corners of the township could have very serious implications, especially in the volatile situation which exists in many areas of the country at this time."

Morris (1980), Mandy (1984), the South African Institute for Race Relations (1985) and others acknowledge that family life and almost all human activities in Soweto have been obstructed by insufficient income, excessive overcrowding, the inferior allocation of National resources to Black health care, Black social welfare services and Black education and the lack of opportunity to improve conditions. While the South African government ministers frequently declare that "ours are the best-off Blacks in Africa" and while this may indeed be true, for the Blacks living in South Africa their point of comparison is their rich White neighbours (Leach, 1986:9). Soweto itself is not isolated but, as Morris (1980:3) describes, "is contrasted strongly with the living standards and aspirations of Johannesburg's White population."

The political climate of Soweto and of South Africa as a whole, is marked by the struggle on the part of the Blacks to remove the restrictions placed on them at all levels and in all activities. It is a struggle for self expression, choice and equal decision- making powers. It is a struggle to dismantle apartheid and its enforcement through mechanisms such as the State of Emergency, police brutality, use of the military in the townships, forced removals, influx control, political detentions, bannings and deportations, denial of citizenship, denial of political rights and refusal to talk to the real leaders of the people (Jews for Social Justice, 1984). It is a struggle for a non-racial, just and democratic social order.

3.5 Community Resources Directly Relevant to the Present Study

The community resources in Soweto that have direct relevance to the present study are those of pre-school child-care systems and health services.

3.5.1 Pre-School Child Care Systems

Pre-school child-care systems refer to "the facilities and programmes required for children before they enter formal education at the age of 6 or 7" (Morris, 1980:159). The major functions of the pre-school child-care system incorporate health and nutrition; physical care and custody; cognitive development (learning) and personality development. Morris (1980:159) identifies the main objectives of pre-school child-care systems as "guiding children through their important formative years and preparing them for entry into the formal education system." Morris (1980) stresses the essential nature of these objectives in Soweto for two main reasons: Firstly, because of the predominance of working mothers; and secondly, because the Soweto community is in a process of transition and adaptation to alien Western systems.

Pre-school child-care is provided in Soweto by three main systems, as follows:

The home, particularly the mother and the extended family, constitutes the primary and traditional form of pre-school child-care. However, increasingly more mothers have to leave the home in order to work and extended family assistance is becoming less accessible due to the geographic fragmentation that separates the urban mother from her possible

support network (Cock, Emdon, Klugman, 1984). Thus, the care of pre-school children gets taken over by informal systems such as extended family, neighbours, servants and childminders. Childcare provided by the home and other informal systems is not well researched and little is known of these forms of child care, other than the fact that large numbers of pre-school children in Soweto are cared for by these systems (Cock, Emdon, Klugman, 1984). In contrast, formal systems such as day care centres, creches and nursery schools are registered and controlled by official bodies and are open to investigation and information gathering.

The administration of formal pre-school services falls under the auspices of the Department of National Health and Population Development, the Department of Co-operation and Development, the Soweto Council and the Johannesburg City Council. Morris (1980:161) reveals that "there appears to be duplication of duty; standards applied may be inappropriately high for the low level of resources and these standards are not in accordance with the actual needs of the Soweto population." The demand for pre-school services in Soweto, as in all townships with poor socio-economic conditions, exceeds the resources available to provide such services. Morris (1980:162) estimates that "some 115 000 children may be in need of pre-school services, while currently only 7 285 are being catered for in formal pre-school services." (For a more comprehensive description of pre-school childcare in Soweto, see Morris, 1980 and Cock, Emdon, Klugman 1984).

Pre-school child care systems in Soweto are grossly inadequate, not only in number, but also in terms of the actual care provided. The State does not assume overall responsibility for pre-schooling (as it does for formal education – racially segregated as this is). The most urgent, widespread and major problems in Soweto's pre-school population involve health, nutrition, physical care and safe-custody. A current suggestion to alleviate the pre-school child care crisis, is to train and educate existing childminders: to upgrade informal childcare systems and to integrate these with formal child care systems (Morris, 1980; Cock, Emdon, Klugman, 1984).

Pre-school child-care systems are dependent on the individual families ability to pay, public funds, welfare organisations and the community at large (Morris, 1980). In Soweto, all of these are sadly lacking. The very root of Soweto's socio-economic structure is apartheid and no attempt to improve pre-school child-care systems can ignore this.

3.5.2 Health Services

The health services available to the population of Soweto are provided by central, provincial and local government as well as by private general practitioners, voluntary and welfare organisations, and alternative healers (Wilson, 1984).

Different aspects of the health service are organised by the three tiers of government as follows: The central government (Department of National Health and Population Development) is responsible for co-ordination and provides community and chronic psychiatric services; dental services; school health services; and family planning motivation (Jinabhai, Coovadia, Abdool-Karim, 1986; Wilson, 1984).

The Provincial Administration (Department of Hospital Services) is responsible for personal health services (curative) and provides services for acute mental illness; family planning services; ante-natal, delivery and post-natal services; and polyclinic and hospital 'curative' services (Jinabhai, Coovadia, Abdool-Karim, 1986; Wilson, 1984). Baragwanath Hospital (situated just outside Soweto) and the associated polyclinics (situated within Soweto) have a staff of more than 8 000, which is insufficient. Baragwanath is the largest hospital in the Southern Hemisphere and while it has an international reputation for its services, research and teaching, it is greatly overextended and short of funds – especially when compared to the Johannesburg Whites-only Hospital (Mandy, 1984 and Morris, 1980). For example, in the Johannesburg Hospital 970 beds are empty. Soweto's population warrants 60 000 hospital beds but there are only 2 700. In the Johannesburg Hospital R185,50 is spent on a patient per day while at Baragwanath Hospital R46,40 is spent on a patient per day (Human Awareness Programme, 1985).

The local government is responsible for preventive and promotive services and is responsible for environmental health services (pest control and the inspection of water and sanitation, but not the provision of these services which is the responsibility of the community council); tuberculosis services; immunisation and child health services; family planning services; community health nurse services; school health team; and health education (Jinabhai, Coovadia, Abdool-Karim, 1986; Wilson, 1984).

In addition to the government-administered health services described above there are other important sources of health care in Soweto. These are health services provided by a number of General Practitioners, 10 major welfare organisations and an estimated 10 000 alternative healers such as sangomas, inyangas and prophets (Wilson, 1984). For further information on health services in Soweto, see Wilson (1984) and Morris (1980).

It is evident then that there are a wide variety of health services in Soweto, the quality and appropriateness of which can be severely questioned. There is no comprehensive and co-ordinated health service and no communication between the 'orthodox' or 'Western' medical services and the widespread alternative healers. This situation in Soweto merely reflects the condition of health services for Blacks in South Africa as a whole. The country's health care scenario is characterised by bureaucracy and fragmentation of services, with huge discrepancies between Black and White, rich and poor, urban and rural ... It is a health system based on apartheid "with Whites, the economically most advanced group, receiving the greatest range of services, and at the highest level" (McKendrick, 1980:26). The majority of Black South Africans undoubtedly need preventative primary health care (de Beer, 1984). Yet, high technology curative medical care consumes approximately 97% of the national health budget (Jinabhai, Coovadia, Abdool-Karim, 1986). Further, as more than 72% of the Black population have been banished to the rural areas of the so-called independent 'homelands', "the South African government has largely abdicated its responsibility to provide (them with) health services" (Jinabhai, Coovadia, Abdool-Karim, 1986). The social goal of health-for-all does not seem to have received any political commitment from the state. Jinabhai, Coovadia and Abdool-Karim (1986, the abstract of the report) confirm this:

> Socio-medical indicators developed by the World Health Organisation for monitoring progress towards health-for-all have been adapted to reveal, clearly and objectively, the devastating impact of state planning based on an outmoded immoral and unscientific philosophy of race superiority in South Africa on the health of the disenfranchised majority within the context of social and economic discrimination.

While existing health services do need to be dramatically upgraded and extended, "it would be unreasonable and unsound to expect the health services to make good the deficiencies of the socio-economic system" (Gluckman Commission, 1970). Health services are far less important to health than are the mechanisms of apartheid and major health determinants

such as overcrowding, water supplies, sanitation, food, employment, income and so on (de Beer, 1984; Wilson, 1984; Jinabhai, Coovadia, Abdool-Karim, 1986).

Thus a primary aim of the present study is to yield data that will enhance the design of a community-compatible prevention program directed towards reinforcing indigenous social and dietary practices which prevent PEM.

Chapter 4. Method

4.1 Design

The information required for the present study was obtained from two primary sources:

(i) the medical records at Baragwanath Hospital paediatric wards and the Diepkloof and Senoane Community Health Centres (polyclinics) in Soweto; and

(ii) by means of in-depth, face to face interviews with mothers of identified Protein Energy Malnourished (PEM) and Adequately Nourished (AN) children. Interviews were conducted in the child's home to allow observation of the household and to evaluate family wealth.

The research design consisted of a retrospective case-control study which was descriptive in nature and compared the environmental characteristics such as dietary, family, socio-economic, health service utilization and medical history aspects of children with overt PEM (the 'diseased' Case group), to those children without these forms of PEM (the 'non-diseased' Control group). Precision control individual matching sampling methods were used.

Fanshel (1980), Comarof (1978), MacDonald (1960) and others assert that most social work research is applied or operational research intent on acquiring knowledge for practical use rather than for theory development alone. The present study conformed with this and was a survey or cross-sectional study, the object of which was a qualitative and quantitative account of an existing situation, which has value for planning and programme implementation (Nisbet and Entwistle, 1974; Kahn, 1960; and Mausner and Kramer, 1985).

The present study sought to contribute towards hypotheses found in the literature about the circumstances (risk factors) associated with PEM occurance, for example: weaning patterns, birth weight (Stein and Ellis, 1974), mothers' level of education (Morley, 1973; Cohn, 1978).

These factors (independent variables) were reasonably permanent characteristics of the child and its environment, so that there was a high probability that the child's status with respect to factors measured at the time of having PEM reflected the child's status at the time PEM was induced (MacMahon and Pugh, 1970). The independent variables studied are described in section 4.3 (The Research Tool).

Interfering or confounding variables were controlled for by matching AN Controls to PEM Cases with respect to specified characteristics (see section 4.2 Subjects). Care was taken to avoid overmatching and only factors that clearly led to confounding were matched.

The retrospective case-control survey methods were particularly well suited to the present investigation, which was a reconnaissance study where there was relatively little information about environmental aetiological factors concerning PEM. There was also the absence of a specific hypothesis, and the search was for statistical associations. These specific research methods were likely to make a distinctive contribution to evaluating the totality of the backgrounds of affected (PEM) and unaffected (AN) children, given the state of existing knowledge about PEM, its incidence and the nature of factors to be explored for possible aetiological significance. The study methods formed an appropriate strategy for ascertaining both risk factors (causes) and disease (effect) simultaneously, and for allowing more than one risk factor to be identified in the same set of data.

Further, these methods of inquiry were both time and cost effective in that a relatively small number of subjects were required (100 children and 100 mothers), since the study was initiated by the identification of Cases which were compared to a like number of Controls, and the results of the study were obtained fairly rapidly (MacMahon and Pugh, 1970; Mausner and Kramer, 1985; Schlesselman, 1982; Grinnell, 1981, Ibrahim, 1979).

4.2 Subjects

The subjects for the present study were fifty Protein Energy Malnourished children and their mothers (Cases) and fifty Adequately Nourished children and their mothers (Controls) i.e. a total of 200 subjects consisting of 100 children and 100 mothers.

This sample size is relatively large when compared to similar South African epidemiological studies. [1]

Protein Energy Malnourished Cases and Adequately Nourished Controls were identified with respect to clearly defined criteria from Baragwanath Hospital paediatric wards, and the Diepkloof and Senoane Community Health Centres (polyclinics) in Soweto. Precision control individual matching sampling methods were used. The procedure for selecting subjects was as follows:

The suitability of Cases and Controls was checked by the researcher according to the clearly defined criteria below. Each PEM Case was selected on the day after admission/examination. The next patient admitted/examined after the PEM Case, who satisfied the specified criteria, was selected as the Control. The first 100 children seen at Baragwanath Hospital and the two polyclinics between 1 November 1984 and 1 April 1985 who complied with the criteria were selected.

To control for seasonal influences, the study was conducted during the rainy season (summer) when there is an increase in gastro-enteritis. Such seasonal complaints were reflected in the sample "since the fever, nutrient loss and dehydration accompanying gastro-enteritis can trigger an overt nutritional crisis in marginally nourished children" (Berlin, 1978 and Scrimshaw, Taylor and Gordon, 1968).

The Case group comprised 50 Soweto children, 54% male and 46% female, between the ages of 6 months and 2 years (with a mean age of 12.9 months, SD 4.4) whose mothers could be located. All the children had PEM as one of their prime diagnoses, and satisfied the Wellcome Criteria for Kwashiorkor, Marasmus or Marasmic Kwashiorkor. The Wellcome Criteria, formulated by the Wellcome Trust Sponsored International Working Party (1970), embodies the following points:

(i) The Boston percentile charts are to be used as norms;

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1 Personal communication, Peter Fridjhon, Dept. of Statistics, Univ. of the Witwatersrand, 1986.

(ii) Any child who weighs less than 80% of its expected weight for age (that is, less than the third percentile) is suffering from PEM.

(iii) PEM itself, is broken down into four categories:

A. Underweight or nutritional dwarf:

These children are clinically well, have no oedema but weigh between 60% and 80% of their expected weight for age.

B. Marasmus:

These children are grossly underweight being less than 60% of their expected weight for age, and have no oedema.

C. Kwashiorkor:

These children weigh between 60% and 80% of their expected weight for age and have clinical evidence of oedema.

D. Marasmic Kwashiorkor:

A child who weighs less than 60% of its expected weight for age and has clinical evidence of oedema.

Children in category A were excluded from the sample as they did not present with a primary diagnosis of PEM. This situation occured because these children appear clinically well and were not typically brought for medical attention (Rosen, 1978).

Children whose nutritional status may have been affected by some major pathology such as chromosomal anomalies, congenital malformations, chronic cardiac, renal or pulmonary disease etc., were also excluded from the sample. Thus only those children whose nutritional status could be attributed to social and dietary factors were included in the study.

It should be noted that the Wellcome classification of PEM is not free from imperfections. The Wellcome criteria have nevertheless been validated by Hijazi (1974) and have been used consistently in malnutrition studies in Johannesburg (Wagstaff and Geefhuysen, 1974; Geefhuysen, Rosen and Katz, 1971 and Geefhuysen, Ipp and Rosen, 1969) and in the American study by Ernester, McAleenan and Larkin (1976).

Rosen (1978:18) asserts that "as far as can be determined, the major weakness in the classification is that the occasional child who develops acute Kwashiorkor may (especially if massive oedema is present) weigh more than 80% of its expected weight for age". In order to compensate for this omission in the Wellcome Criteria, such Cases were included in the study.

The Control group comprised 50 Soweto children, 54% male and 46% female, between the ages of 6 months and 2 years (with a mean age of 12,8 months, SD4,5), whose mothers could be located, all of whom were Adequately Nourished in terms of their weight being on or above the 25th percentile of the Boston Weight for Age percentile charts (Jellife, 1966).

It was ensured that these children were free of overt signs and symptoms of PEM such as oedema, flaking skin, mottled teeth, bleeding gums and dull, discoloured and sparsely distributed hair (Jellife, 1966).

The Control group was selected to have some of the characteristics of the Case group, and therefore individuals selected from the Control population had to match the corresponding Case with respect to specified criteria, i.e. controlling for interfering/confounding variables (MacMahon and Pugh, 1970). All Cases and Controls were hospital or polyclinic patients and all were recruited from the Soweto population. The mothers of all the children in the sample could be located in Soweto. Children of mothers who lived outside the Soweto area, the children of mothers who had abandoned them, and the children of mothers who had died were not included in the sample. Sex and Age within two months of Cases and Controls were matched.

The mothers in the sample had a mean age of 26,27 years (SD 6,20). They were predominantly Sotho- (25%) and Zulu- (30%) speaking. The mean level of education was a standard 6 pass (SD 2,26), 4% of mothers had never been to school, and 3% of mothers had achieved or were undergoing tertiary education.

4.3 The Research Tool

The research tool consisted of an interview schedule which was designed to structure the interviews in a particular way. The planning, design and construction of the interview schedule was based on two processes:

(i) a survey of the literature (as described in chapters 1, 2 and 3); and

(ii) written communications, consultations and interviews with Soweto residents and resource persons in the fields of paediatrics, epidemiology, nursing, social work, social anthropology, sociology, psychology and statistics.

The preliminary investigation established that there was much existing information that had not been written down, or otherwise published.

In constructing the research tool, thorough consideration was given to Grinnell's guiding principles of maximizing the response rate of individuals in the sample, and of minimizing the amount of measurement error in the responses of individuals (Grinnell, 1981: 156-179). As suggested by Backstrom and Hursh (1963:92) and Simon (1986:45), the interview schedule was designed in four parts, consisting of:

(i) an introduction (which was attended to by the covering letter);
(ii) demographic questions;
(iii) warm-up questions; and
(iv) the body of the study.

Use was made of both open- and closed-ended questions. Several different questions relating to one variable were included, as cross-checks, to see if the respondent answered these in a consistent way. As described by Williamson, Karp and Dalphin (1977:147), "Such questions allow for an appraisal of the validity of the questionnaire and of the accuracy of the respondents' self-reports."

The interview schedule was ordered in a flowing pattern although there were 'non-standardized' sections (e.g. the questions on reproductive history) which necessitated that the questions be reordered, rephrased and explained to fit the characteristics of each respondent. It is important to note that the nature and type of information elicited in this section was standardized and the term 'non-standardized' refers to the manner by which the information was obtained.

The interview schedule did not constitute a question/answer session. Instead, interviews took the form of a discussion where a conversational atmosphere was established by the interviewer. The interview schedule was worded in clear, simple English and relied on the interviewer's translation into the appropriate languages. While the possibility of ambiguity and bias does exist, the research tool was especially designed to accommodate individual respondents and thereby required the interviewer's flexibility of expression (regardless of a particular language), while maintaining the standardized purpose of each specific question.

The research tool also contained items which the interviewer was instructed to observe and comment upon. These related to the mother's appearance, her non-verbal behaviour and the physical condition of the household.

The interview schedule was designed in accordance with specific areas of investigation, referred to as indices, which were composed of a number of independent variables. The following reflects, in summary form, the nature of the indices which provided the foundation for the interview schedule (see appendix A for the complete interview schedule).

4.3.1 Nature of the Indices

A. Household Structure
- number of people per household
- sex ratio per household
- economic contributors per household

B. Family Type
- single parent, extended family, etc.

- child's position in the family (birth order, paternity, age and sex)

C. Household History

- length of residence and mobility within the last 3 years
- use of drugs, alcohol
- number seriously ill (besides child)

D. Household Inventory

- nature and condition of physical possessions
- medical aid scheme

E. Dietary Patterns

- of household
- of child
- breastfeeding and weaning practices
- milk formulae
- milk preparation and hygiene

F. Child Rearing Practices

- when mother rears child herself
- use and type of childminders

G. Medical Aspects

- medical history of child
- use of primary health services

H. Maternal Characteristics

- age
- home language
- education
- employment status
- nutrition
- reproductive history
- attitude towards child
- drinking habits
- social support

These scales were identified by and adapted from Rosen et al (1978) and incorporated concepts from Cock (1980), Block (1969), Jellife (1966), Young and Trulson (1960) and Eyberg (1934). Already existing instruments were not utilised in their original structure in the construction of the interview schedule, as there were none that were completely suitable to the present study.

Rosen et al's (1978) scales were formulated in a research proposal entitled "The Bantu Child at Risk of Developing Malnutrition". This research was never executed and as a result the scales were not developed further than draft instruments, which were invaluable in the construction of the research tool for the present study (Rosen, 1978).

The interview schedule that Cock (1980) used in her study on "Maids and Madams" provided a guide for the tone and nature of questions relating to the mother's demographic details, her work situation, her social support system, and her relationship with the child's father. Every effort was made to assimilate into the research tool Cock's approach of sensitivity, consideration and respect for the respondents' feelings.

The section on the mother's attitude toward the child was based on items selected from Block's (1969) Child-Rearing Practices Report (CRPR). The CRPR measures maternal child rearing practices and attitudes. Solarsh (1986:99-100) explains the development of the CRPR:

> The CRPR was derived from empirical observations of mothers interacting with their children in different experimental situations. Mother-child interactions in standardized situations were observed and quantified using both a behavioural checklist and a set of Q-items tapping interpersonal or interactional behaviours... To supplement the em-

pirically derived item pool, a thorough review of the socialization literature was conducted and additional items were written to tap dimensions not included in the observational study. The item pool was further enriched by input from Block's colleagues in several European countries during a research year abroad.

The value of the CRPR for the present study was its identification of types or patterns of mother-child interactions, and what Block (1969) demonstrated as its congruency between maternal child-rearing attitudes and actual maternal child-rearing behaviours.

The CRPR was not used as a research tool in its original form for two reasons:

(i) its detail and length were beyond the scope of the present study; and

(ii) it tended to be directed toward white middle class respondents.

The CRPR was therefore modified toward Black, low income respondents and only the items which were considered to have a possible influence on the child's nutritional status were used. The items which were selected and altered from the original 91 items of the CRPR were:

- three items measuring OPEN EXPRESSION OF AFFECT;
- two items measuring NEGATIVE AFFECT TOWARDS CHILD;
- three items measuring NON-PUNITIVE MODES VERSUS AUTHORITARIAN CONTROL;
- two items measuring SUPERVISION OF CHILD;
- one item measuring ENJOYMENT OF MATERNAL ROLE.

Dietary patterns of the household and of the child were conducted by the recording of habitual food intakes – a method suggested by Eyberg (1984). An attempt was made to assess the child's exact nutrient intake by asking the mother to complete a 24 hour dietary recall of the previous day (Jellife, 1966; Young and Trulson, 1960; Eyberg 1984). The 24 hour dietary recall was conscientiously carried out by the interviewer, but was discarded in the dietary assessment of the child because 95% of mothers were not in a position to complete the detailed recall, since in many cases, they did not personally feed the child during the day.

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The list of possible household expenses, adapted from a SALDRU fact sheet (1983), and details regarding the occupation and earnings of household members, were also discarded in the statistical analysis because the mothers did not know this information. Thus, the questions designed to elicit information on the 24 hour dietary recall, the household expenditures and the household incomes, failed to achieve their anticipated purpose. It was perhaps unrealistic of the researcher to expect the mothers to know this information.

The feasibility of the interview schedule was pretested on 4 subjects. The clarity and necessity of each question was checked, after which the fourth and final draft of the research tool was completed.

4.4 Procedure

Permission was granted by the Transvaal Provincial Administration, the Paediatric Superintendent of Baragwanath Hospital and the Superintendent of the Diepkloof and Senoane Community Health Centres (polyclinics) to conduct the study, consult the medical records and hospital/polyclinic staff and have access to the patients. The process of obtaining this permission took a period of 3 months. As a non-medical student undertaking research in a medical setting (hospital and polyclinics) and as a white person wishing to enter the Black township of Soweto during times of political unrest, various arrangements had to be made. Separate written applications by the researcher, her supervisor and her consultant were made to 3 Superintendents of Baragwanath Hospital, the Superintendent of the polyclinics and to the Director of Hospital Services in Pretoria (Transvaal Provincial Administration). Further, the researcher was interviewed by the Superintendent of the polyclinics and the Director of Hospital Services. The researcher did not require a permit to enter Soweto as she was granted the status of Honorary Appointee of Baragwanath Hospital and thereby had access to limited areas of Soweto.

Data was collected through face to face interviews with mothers of the identified PEM and AN children. Information relating to medical histories and health service utilization was gathered both by the researcher from existing medical records, as well as by the interviewer from the mothers. Interviews took place in the child's home and were conducted by a trained interviewer in the mother's home language. It was explained to the mother that very little was known about the kind of environment that the children at Baragwanath hospital and

the polyclinics came from, and that in order to gain an understanding of the children's background, the mother's help was needed in discussing various aspects of her family life. The mother was assured of complete confidentiality and interviews were conducted only if the mother's consent had been given. No mother declined to participate.

The sample design and interview schedule were pretested and a pilot study of the entire research procedure was done on 2 PEM Cases, 2 AN Controls and their 4 respective mothers.

Interviews were in-depth and focused. The interview schedule constituted the guideline and framework for the interviews, and the same type of information was obtained from all respondents. Without detracting from the research focus during the interview, the interviewer offered a professional service in terms of informing mothers about relevant community resources, giving nutritional advice and providing emotional support for mothers whose children were severely ill, for the mother whose child had died a few hours before the interview and for mothers who were generally distressed by their living conditions and social circumstances. Of the interviews, 67% took place during the day (i.e. between 6h00 and 17h30), and 68% during the week (Monday to Friday). The mean length of interviews was 43 minutes (SD 10.69).

The person employed as the interviewer was a 48 year old Black Sowetan woman, professionally qualified as a Social Worker, trained in advanced interviewing techniques and holding a Masters Degree in Public Health from the University of North Carolina (Chapel Hill, USA). The interviewer was able to speak all the African languages and the various dialects that emerged in the sample. The interviewer was chosen for her skill in interviewing, her experience in the field of nutrition and because of her knowledge of the sample's socio-cultural practices. It was also felt that respondents would be able to relate more easily to a Black older Sowetan woman who could speak their own language.

Interviewer training centred around providing the interviewer with a sound understanding of the nature and aims of the research study, the interview schedule and the purpose of each specific question. Already highly skilled in interviewing techniques, the interviewer was merely reminded to "maximize the forces to communicate and direct and control the communication process to specific objectives" (Moser and Kalton, 1971:286). It was reiterated that the interviewer establish a good workable rapport with the respondent without losing sight of the research aims. The interviewer was instructed to probe for additional informa-

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