



UNIVERSITY  
OF NATAL

**I S R**  
DURBAN

# **A STUDY OF MALNUTRITION IN THE NQUTU DISTRICT OF KWAZULU**

**L. SCHLEMMER  
P. STOPFORTH**

**INSTITUTE FOR SOCIAL RESEARCH**

**MAY, 1975      FACT PAPER No. 2**

A STUDY OF MALNUTRITION IN THE  
NQUTU DISTRICT OF KWAZULU

---

by

LAWRENCE SCHLEMMER

PETER STOPFORTH

in collaboration with

John Reid

Hilstan Watts

JULY 1974

Revised MAY 1975

Fact Paper No. 2

PREFACE

This study arose out of a deep sense of concern about malnutrition in the African areas of Natal. Members of the Black Sash, a women's organisation, took the initiative in approaching Prof. John Reid of the Medical School of the University of Natal, a noted authority on malnutrition, and Dr. Anthony Barker, of the Charles Johnson Memorial Hospital at Nqutu, in connection with a possible study.

Mrs. Doreen Patrick, Mrs. Sarah Burns and Mrs. Cherry Hill convened an initial meeting between themselves and Prof. Reid, Dr. Anthony Barker, Dr. Maggie Barker, Dr. and Mrs. G. Daines of St. Lucy's Hospital, Tsolo, Dr. C. Orchard of McCord Zulu Hospital, Durban and Prof. H.L. Watts of the Department of Sociology at this University.

At a subsequent meeting I was drawn into the deliberations and John Reid, Hilstan Watts and I conceptualised the research design and data-gathering procedures. Hilstan Watts and I collaborated on the actual drafting of the research schedule. Copies of the schedule were produced by Mr. Percy Patrick, Public Relations Officer of the University of Natal.

The initial intention was that both out and in-patient children at the three hospitals mentioned above would be subjected to study, and that the study would proceed over an extended time period of two years.

Due to various practical difficulties, only the Charles Johnson Memorial Hospital was able to sustain the research effort over a full year, and hence this study owes its entire success to the dedicated efforts of Drs. Anthony and Maggie Barker and their staff.

The coding of the completed schedules was undertaken by Mesdames Patrick, Burns and Hill with guidance from this Institute. The computer analysis of the results was undertaken, under my supervision, by Mrs. Ulla Bulteel, our Technician. The writing of this report was the responsibility of Mr. Peter Stopforth, Research Fellow in this Institute, in consultation and collaboration with me. The typing and production of the document were ably undertaken by Mrs. Patsy Wickham and Miss Ann Morton of this Institute and by Mrs. Thea Mather.

The project, then, is an example of a collaborative effort involving many people. The authors of the document would like to express their most sincere appreciation of the willing and dedicated co-operation of all concerned. We are disappointed that results from one urban hospital and one other rural mission hospital were not available to deepen our analysis. It is our hope, however, that the problems outlined in this report will encourage similar research to be undertaken on a larger scale and on a comparative basis in the future.

Since the first publication of this paper in July 1974, demand has required a further issue. This allowed us to extend the final chapter and to include a supplement relating to a follow-up investigation.

Lastly, I would like to express my appreciation and respect of the Black Sash in Natal, for taking the initiative in the early stages of the project and for assisting, both with labour and finance, in the successful completion of the undertaking.

Prof. L. Schlemmer,  
Director.

Institute for Social Research,  
University of Natal,  
Durban.  
May, 1975.

C O N T E N T S

<u>Chapter</u>		<u>Page</u>
	Preface	(i)
I	General Overview	1
II	Statistical Evidence of Undernutrition	11
III	General Morbidity in Nqutu	40
IV	Malnutrition Diseases	44
V	Conclusion and Comment	50
	Appendix - Case Record Schedule	63
	Supplement	66
<u>Table</u>		<u>Page</u>
I	Number and Percentage of Patients Recorded Below the 3rd Boston Percentile with Respect to Weight and Height for Age	5
II	Diagnosis Made By Doctors of the Charles Johnson Memorial Hospital	7
III	Distribution of Patients Above and Below the 3rd Boston Percentile Weight and Height for Age Related to Primary Diagnosis	15
IV	Distribution of Cases Recorded as Below the 3rd Boston Percentile Weight for Age Associated with Level of Cash Income Available in the Homes of Patients	21
V	Distribution of Cases Recorded as Below the 3rd Boston Percentile Weight for Age Associated with Numbers of Adults and Children dependent on Cash Income in the Home	23
VI	Relationship between Consumption of Certain Foods Prior to Admission and Diagnosis of Weight for Age Recorded Below the 3rd Boston Percentile	27

<u>Table</u>		<u>Page</u>
VII	Relationship between Consumption of Certain Foods Prior to Admission and Diagnosis of Height for Age Recorded below the 3rd Boston Percentile	35
VIII	Admissions with Clearly Diagnosed Malnutrition: The Relative Importance of "Key" Variables Associated with Malnutrition Condition as Scaled by Medical Personnel (Informal Criteria) Expressed as a Percentage	39
IX	Relationship between Consumption of Certain Foods Prior to Admission and Diagnosis of Kwashiorkor and Marasmus Expressed as a Percentage of Each Disease	47
X	Admissions Suffering from Kwashiorkor and Marasmus: The Relative Importance of "Key" Variables Associated with Kwashiorkor and Marasmus as Scaled by Medical Personnel (Informal Criteria) Expressed as a Percentage of Each Disease	49
 <u>Graph</u>		 <u>Page</u>
Fig. (i)	Percentage Distribution of Three Diseases During the Months of 1972	41

CHAPTER IGENERAL OVERVIEW

This report comprises an analysis of records compiled for all children five years old and under attending the Charles Johnson Memorial Hospital or any of the eleven satellite clinics of the hospital during 1972. The hospital record schedule\* for each patient seeks to elicit a range of medical and sociological information pertaining to patient as well as his or her home circumstances. The hospital has facilities for treating both in- and out-patients and while some record information is common to all patients, additional information is available for in-patients.

Nqutu lies in North Central Natal and constitutes a part of Kwa Zulu: the area and population are rural and at the 1970 census this district accommodated 79 690 Africans; 70 928 are described as Zulu, 8 065 as Seshoeshoe and the balance comprise a variety of African "Tribal groups".<sup>1)</sup> As Nqutu is a relatively remote rural area it can be safely assumed that the patients considered in this study are resident in the immediate vicinity of the district, and that our tabulations below reflect local circumstances of disease and not the diffuse geographical distribution common in the statistics of hospitals in large urban centres in South Africa.<sup>2)</sup> What cannot be determined, however, is the extent to which an

- 
1. Department of Statistics, 6 May, 1970, Population Census. Report No. 02-05-01, Population of Cities, Towns and Rural Areas. Republic of South Africa. Table 2; pp 56-57
  2. Watts, H.L. and Lamond, N.K. 1966. A Study of the Social Circumstances and Characteristics of the Bantu in the Durban Region. Report No.2. The Social Circumstances of the Bantu, Institute for Social Research University of Natal, Durban. pp 34-35.
- \* For case record schedule, see Appendix.

enumeration of hospital records reflect the true state of the distribution of health and disease in a particular area. Quite obviously the principle of self selection (via parents) operates in the present case. Two probable complex statistical biases might be mentioned with regard to self selection:

- i) Children that are ill are more likely to be brought for treatment than children that are well. 1)
- ii) Children whose parents are amenable to modern medical therapy are more likely to be examined whether ill or well than children whose parents place more reliance on traditional medicine.

Clearly, these biases are not mutually exclusive and their unknown variable operation makes it impossible to estimate means and distributions for the Nqutu population as a whole.

Notwithstanding the non-parametric nature of our data, some estimation of the proportion of the population 0-5 years <sup>2)</sup> in Nqutu covered by 1972 records might be attempted. Available census data does not report age distribution for Nqutu district; however, such a tabulation is reported for Zulus in rural Natal. In rural Natal, Zulus in the age interval 0-4 years comprise 18,3% of this population. <sup>3)</sup> Above we have quoted a census figure of 79 690 persons (70 928 Zulus) for Nqutu district. On a

- 
1. No doubt children living at a distance from hospital or clinic stand less chance of being brought to such a centre than children in the more immediate vicinity.
  2. As the census report used for this estimate does not give separate figures for intervals of a year, our estimate of coverage will be based on the standard cohort 0-4 years.
  3. Compiled from Department of Statistics May 1970, Population Census (sample tabulation). Report No. 02-02, Bantu-Age, occupation, Industry, School Standard, Birthplace. Republic of South Africa. Table B7; p.54.



crude percentage basis then (not taking account of population increase since 1970) the population 0-4 years of Nqutu is approximately 14 583 persons (or 12 980 Zulus). During 1972, 4 833 patients 0-5 years (no patient duplicated in records) were examined by the medical personnel of the hospital. Their age distribution is as follows:

<u>Age</u>	<u>n</u>	<u>%</u>
0-5 months	1 334	27,6
6-11 months	1 126	23,3
12-17 months	778	16,1
18-23 months	505	10,5
24-35 months	562	11,6
36-47 months	305	6,3
48-59 months	138	2,9
60 plus months	20	0,4
No information	65	1,3
	<hr/>	
	4 833	100,0
	<hr/>	

Taking all patients 0-47 months old (0-4 years) and a likely proportion of patients for whom there is no age information, i.e. 62 persons, we can calculate on this crude basis that 32 percent of the population 0-4 years in Nqutu district was examined by personnel of the hospital or clinics.<sup>1)</sup> Just over 50 percent of patients examined are included in the category 0-11 months and there is no significant difference in representation of the sexes of all patients.

The distribution of patients examined by medical personnel during the year is not even. From the tabulation

---

1. Bear in mind that census enumeration of rural Africans very often underenumerates in the lower age categories. For example, a similar approximation for patients 0-11 months yields a percentage coverage of that population by the hospital of 88 percent. Clearly this is not a credible figure and our calculation of 32 percent is probably an overstatement.

below it can be seen that 48 percent of the patients were examined during the period January to April.

<u>Date</u>	<u>n</u>	<u>%</u>
Jan-Feb	1 311	27
March-April	1 024	21
May-June	526	11
July-Aug	806	17
Sept-Oct	644	13
Nov-Dec	522	11
	<u>4 833</u>	<u>100</u>

This distribution seems to accord with the percentage distribution of primary diagnosis made by doctors over a range of diseases. On a percentage basis malnutrition, parasitism, TB, respiratory diseases and infections are diagnosed most frequently during the period January to April (the peak for these disorders is January/February). Further gastro-enteritis peaks during January/February, childhood diseases while most frequently diagnosed during September/October show a small secondary peak during January/February. The incidence of Trauma in this youthful category registers a substantial peak during the period March and April. However, while most healthy children (24 percent of all patients) are examined during September and October, 25 percent of this large category (1194 children) are examined during January and February. It is therefore possible that the distribution of patients examined during 1972 is determined in some measure by the periodic incidence of disease during the year. Of the 4 833 patients examined 536 or 11 percent were admitted to the hospital as in-patients.

As mentioned above, of the 4833 children examined during 1972, 1194 or 24 percent are described as

healthy. The balance all suffer from one or more disease, including malnutrition, or from defects in maturation as measured by the American Boston Percentile distributions. Table I below describes the incidence of low weight and height for age recorded during 1972 using the Boston Standard. It is clear that approximately 30 percent or more of patients examined during 1972 are below a standard of maturation considered to be equitable given adequate nutrition.

Table I Number and percentage of patients recorded below the Boston 3rd percentile with respect to weight and height for age

Maturation	Below Boston 3rd Percentile	
	N	%
Weight for age <sup>1</sup>	1300*	27
Height for age	1874**	39

N = 4833

\* No information 87 patients (1,8 percent)

\*\* No information 237 patients (4,9 percent)

Further to measurements involving weight and height for age, doctors of the hospital recorded a primary

- 
1. The incidence of 1300 patients recorded with low weight for age is drawn from specific readings on the record schedule designed to elicit this information. However, doctors were required to consider low weight for age as a category of a variable describing "clearly observed symptoms of malnutrition"; here the incidence of low weight for age is recorded as 1471 patients (30 percent) with information not available for 146 cases (3 percent).

diagnosis, a specific diagnosis of malnutrition and "other associated diseases"<sup>1)</sup> for each patient. Single or multiple diagnoses were made in each case. Table II below describes the distribution of the first and second separate diagnostic exercises. In general it can be stated that approximately 25 percent of children in the age category 0-5 years who have been examined at the hospital are normally healthy. Concerning the balance, respiratory ailments and gastro-enteritis are prominent diseases. It is alarming that the third most common disease recorded in primary diagnosis is malnutrition among 8,9 percent of all patients examined, which together with a high incidence of low weight and height for age suggests a potentially broad base of malnourishment among small children. The predominance of Kwashiorkor and Marasmus in specific cases of malnutrition point to both inadequate protein diet as well as dietary deprivation for many children. If attention is shifted to the admission of 536 in-patients during 1972, and if the high incidence of malnutrition among other diseases in this group is at all indicative of, or associated with, the general pattern of disease among patients visiting the hospital or the community in general then the situation as regards the nutrition of children is grim indeed. Of in-patients admitted 378 or 70,5 percent were diagnosed as suffering some form of malnutrition.

---

1. The record of "other diseases" associated with observed malnutrition disorder is not of a standard useful for this type of report. There is some doubt whether medical personnel checked this variable consistently after making a primary diagnosis and then a particular malnutrition diagnosis.

Table II Diagnoses made by Doctors of the Charles Johnson Memorial Hospital.

Multiple Primary Diagnosis			Diagnosis of Clearly Observed Malnutrition		
Disease	N	% out of 4833	Malnutrition	N	% out of 431
Respiratory	1519	31,4	Kwashiorkor	176	40,8
Gastro-enteritis	578	12,0	Marasmus	97	22,5
Malnutrition	431	8,9	Pellagra	52	12,1
Trauma	399	8,3	Rickets	25	5,8
Childhood disease	200	4,1	Scurvy	18	4,2
Parasitism	191	4,0	Other	28	6,5
TB	76	1,6	No information	35	8,1
Other infections	480	9,9			
Other diseases	237	4,9			% out of 4833
Healthy child	1194	24,7			
			Low weight for age	1471	30,4
			No malnutrition	3194	66,1

7.

Multiple diagnoses were made in the case of some patients but the situation is nevertheless clear: 310 or 57,8 percent of in-patients were diagnosed as being below the 3rd Boston Percentile weight for age; 204 in-patients (68 of whom were above the 3rd percentile) or 38 percent were diagnosed as suffering from specific malnutrition disease. This specific disease distribution among in-patients is tabulated below:

<u>Malnutrition (specific) diagnosed among in-patients</u>	<u>N</u>	<u>%</u>
Kwashiorkor	100	49,0
Marasmus	80	39,2
Pellagra	14	6,9
Rickets	6	2,9
Scurvy	2	1,0
Other	2	1,0
	<u>204</u>	<u>100,0</u>

Note that the general incidence of malnutrition, 8,9 percent rises to 38 percent among in-patients and that the diseases of Kwashiorkor and Marasmus require hospitalization with greater frequency than the essentially vitamin deficiency disorders.

The incidence of health and disease reported above occurs against what might be considered a poverty-stricken background - both as regards income and general lack of development - 166 patients (3,4 percent) live in homes where there is reported to be no cash income. The mean cash income per month received in homes of the balance (excluding 96 homes for which there is no information and one individual who earns over R100 per month) is R13-64. The cash income mode is R12-00 and the range is from R2-00 to R90-50.

There is a mean of 2,9 adults and 4,3 children (under 16 years) dependent on cash income received in the homes of patients examined. Calculated on mean income received and not differentiating between adults and children this represents 6,3 cents per head per day. In 78 percent of cases the father is the chief breadwinner of patients' families, in 4 percent of cases the mother, and in 17 percent of cases other kin are responsible for providing for the families concerned. This does not mean that the fathers of patients are normally resident at home. By scrutinizing the distance of place of work of the breadwinner from home contained in the tabulation below it can be stated quite safely that at least 75 percent of breadwinners live away from home as a rule and that it is likely that this figure could be 10 percent higher. The bulk of employment is in the category of unskilled labour representing 64 percent of breadwinners; clerical workers are a small category of 3,8 percent followed by routine non-manual 7,4 percent and skilled/semi-skilled manual workers 17,8 percent.

<u>Distance of place of work from home in miles</u>	<u>N</u>	<u>%</u>
1-20	530	11,4
21-50	605	13,0
51-100	159	3,4
101-200	442	9,5
201-400	2 892	61,9
401-600	38	0,8
601-700	5	0,1
	<u>4 671</u>	<u>100,1</u>

Of the breadwinners, 4,4 percent are unemployed and 2,7 percent are on pension. The picture is one of low cash income, large number of dependants and fragmented family life due to a migratory system of labour.



CHAPTER IISTATISTICAL EVIDENCE OF UNDERNUTRITION<sup>1)</sup>

It has been stated that, "it is not improbable that for every florid case (of malnutrition) brought to the attention of the health authorities, 8 or 9 potential cases lie hidden, to be revealed only when some inter-current infection precipitates the florid form of the disease".<sup>2)</sup> Extrapolating on this basis there is then a probability that some 3017-3438 potential cases of malnutrition among young children lie hidden in the Nqutu district (on the basis of 431 cases of malnutrition diagnosed by hospital authorities, See Table II)<sup>3)</sup>. Were this to be true, then approximately 25 percent of this youthful cohort in the district are threatened by the chance of succumbing to a florid case of malnutrition disorder. While these figures are based on an arbitrary raising factor and prediction may be tenuous, there does appear to be a situation which is conducive to the development of florid malnutrition maladies. Firstly, the great majority of children come from very poor homes and generally socio-economic conditions are such that few people can be able to sustain a nutritious diet.

- 
1. Nesor, M.L. (1965): "Can We Eradicate Malnutrition in South Africa?" S.A. Medical Journal, 39, 1158-1163, p. 1159. See short discussion on malnutrition, defective nutrition and undernutrition.
  2. Dawel, J.G.A. (1965): "The Incidence of Malnutrition Among Bantu Children." S.A. Medical Journal, 39, 1148, p. 1148.
  3. It must be borne in mind that the 431 cases of diagnosed malnutrition span a period of 12 months and that extrapolation (based on an arbitrary raising factor) does not reflect the periodicity of precipitating intercurrent infection, or for that matter, any number of intervening variables associated with malnutrition, latent or florid. We are also not certain as to whether or not the recording of incidence over a full year would increase the probability of otherwise latent malnutrition being recorded due to accumulation of precipitatory factors.

Secondly, the incidence of infectious and other diseases diagnosed among children 0-5 years old at the hospital (Table II) suggests that occasions for precipitation of florid malnutrition are rife. For example, among infants and children, 0-4 years old, diagnosed as suffering from respiratory disease during 1972 the rate per 1000 examinations for patients visiting the hospital is 324 and the rate per 1000 expressed for the total population 0-4 years in Nqutu district on the basis of hospital records is 103. As the records reflect three medical functions, hospital, clinic and medical extension there are apparently no comparative figures for rates of respiratory disorder that will allow us to make objective statements about the rate of intercurrent disease in the Nqutu district. However, as records show a single visit for each of the 4833 patients we assess that an incidence of respiratory disease diagnosed among 31 percent of all patients is high (this incidence rises to 41 percent when healthy patients are disregarded in the total), with the proviso that this has yet to be absolutely demonstrated. Taking this incidence of respiratory disease together with a statistic of 75 percent overall morbid diagnoses (refer to Table II) and given that the medical service in Nqutu is multi-functional then the argument that intercurrent disease is a potential factor in the precipitation of florid malnutrition in the area may be countenanced with some confidence. Finally, and most important, undernutrition as judged by underweight and stunting conditions among patients suggests that there is already a broad base of latent malnutrition among infants and young children examined at the hospital. It is not inconceivable that this state of undernutrition observed among

patients examined at the hospital is generic to the district. If this be the case then the statistics below auger little good for a significant proportion of a whole and for any succeeding, generation in the area.

The standard used for judging underweight and stunting conditions is the Boston Percentile distribution of weight and height for age. Infants and children who fall below the defined 3rd percentile on the American standard are judged to be below weight and/or height for age, the causal inference of this condition being undernutrition. Use of American standards might be questioned. However, Prof. J.V.O. Reid cites from a study of over a decade ago stating that privileged African children have the same mean weight and height figures as privileged American children.<sup>1)</sup> On this evidence there seems to be no reason why given adequate nutrition the potential of African children is not comparable with that of American children and consequently the use of American standards constitute an adequate diagnostic instrument for measurement of undernutrition.<sup>2)</sup> With respect to percentile distributions height is considered to be a more reliable indicator than weight.<sup>3)</sup> Weight can fluctuate widely over a short period in association with many independent variables, height has a change potential in only

---

1. Reid, J.V.O. (1971): Malnutrition, in Randall, P. (ed.) Some Implications of Inequality. SPRO-CAS, Occasional Publication No. 4. Johannesburg. p.36.

2. While we cannot contradict the assurances given on the basis of expert knowledge, we hope that the presence of Khoisan genes in the Southern Bantu-peoples does not imply that the applicability of Boston height standards can be questioned.

3. Personal communication from Prof. J.V.O. Reid.

one direction and is more likely to reflect the established relative health of the individual. Below we examine some of the socio-economic associations with diagnoses of low weight and height for age. We shall refer to a diagnosis of weight for age below the 3rd percentile as low weight for age (LWfA) and similarly for height as low height for age (LHfA).

Not all patients that are judged to be LWfA are stunted and vice-versa; 911 patients were found to be both LWfA and LHfA constituting a category of 18,8 percent of all patients. It is suggested that this category of patients is the most vulnerable with regard to potential malnutrition (excluding those that already suffer from a malnutrition disease) and it would seem that the incidence of actual malnutrition disease could increase quite rapidly under adverse conditions among what might be considered to be a particularly undernourished group of children (just under 20 percent of patients), then diffusing to other LWfA and LHfA children (approximately 30 and 40% respectively including the 20 percent mentioned above).

Before proceeding with a separate consideration of the distribution of weight and height for age among patients we present what could be termed an "informal control" for evaluating the incidences discussed: both with respect to distributions among patients as well as extrapolation to the relevant population cohort of Nqutu district. Table III describes the distributions of all patients according to primary diagnosis (including so called healthy patients) in terms of whether they fall above or below the 3rd Boston percentile weight and height for age. Now we know from Table I that among all patients 27 percent and 39 percent were diagnosed LWfA and LHfA respectively.

**Table III** Distribution of patients above and below the 3rd Boston Percentile Weight and Height for age related to Primary Diagnosis.\*

	Weight						Height					
	Above		Below		No Inf.	N	Above		Below		No Inf.	N
	N	%	N	%			N	%	N	%		
Healthy child	935	78,3	234	19,6	25	1194	749	62,7	397	33,3	48	1194
Trauma**	329 (5)	89,4	36 (1)	9,8	3	368 (6)	247 (3)	67,1	111 (3)	30,2	10	368 (6)
Malnutrition	126	33,7	245	65,5	3	374	132	35,3	218	58,3	24	374
Parasitism	136	76,4	38	21,4	4	178	92	51,7	75	42,1	11	178
Childhood Disease	91	55,8	64	39,3	8	163	68	41,7	79	48,5	16	163
T.B.	36	52,2	33	47,8	0	69	21	30,4	44	63,8	4	69
Respiratory Infection	1019	74,2	323	23,5	32	1374	824	60,0	469	34,1	81	1374
Gastro-Enteritis	295	62,2	171	36,1	8	474	245	51,7	210	44,3	19	474
Other infections	334	79,5	84	20,0	2	420	241	57,4	164	39,1	15	420
Other diseases	140	65,7	71	33,3	2	213	100	47,0	104	48,8	9	213

N = 4833

\* Only first primary diagnosis considered

\*\* Patients with Trauma as only diagnosis (multiple diagnosis, including Trauma, in parenthesis)

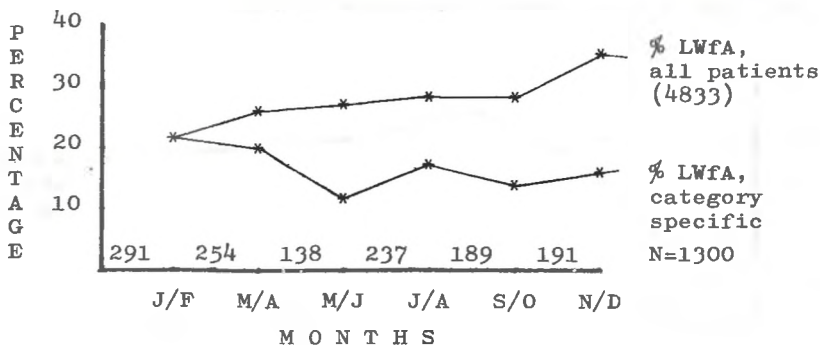
When we consider patients who are positively diagnosed for a morbid condition (excluding healthy children) the respective percentages rise slightly to 32 and 42. It is therefore not surprising to note that among healthy children diagnoses of LWfA are made in 19,6 percent of cases and LHfA among 33,3 percent of cases. This suggests that low weight and stunting are somewhat generally distributed among this age group in the society. To follow up this argument we isolated cases of Trauma only, on the assumption that chance plays a major role in determining their visit to the hospital and that this group of patients would be the closest to a "sample" of the age group 0-5 years in the Nqutu district for determining distribution of weight and height. It is clear from the row Trauma in Table III, that 9,8 percent of Trauma patients fall below the 3rd percentile WfA and 30,2 percent below the 3rd percentile HfA. Thus height statistics (stunting) show a relatively consistent pattern - among morbid as well as healthy patients and among patients in the "control sample", while statistics on weight tend to vary considerably for various groups of patients. This suggests two standards for the interpretive value of low weight and stunting:

- i) Height is a more consistent indicator of the relative health of a population over the long term than weight.
- ii) Weight is more likely to indicate fluctuations in short term health and morbidity among a population than height.

WEIGHT

It has been established that some 1300<sup>1)</sup> of the 4833 patients 0-5 years examined by the hospital or clinic personnel at Nqutu during 1972 were recorded as falling below the 3rd Percentile for the Boston Weight for age distribution. The periodic distribution of this 27 percent incidence of low weight for age during 1972 has two facets of interest:

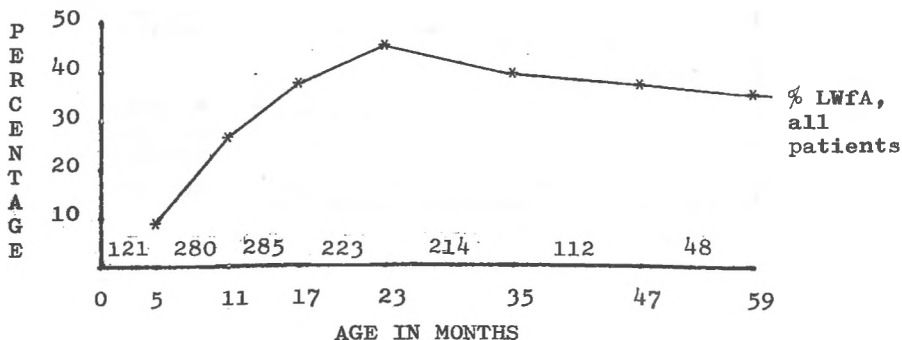
- i) The percentage of low weight for age (LWfA) patients when all patients are considered is highest during December, rising steadily during the year.
- ii) The distribution within the category LWfA expressed as percentage variation over the 12 months is highest during the period January to April.



1. Data on weight for age was not recorded in the cases of 87 patients.

This is to say that of patients examined during 1972 the proportion of LWfA diagnoses increased with the passing of the months, being 22 percent at January/February and 37 percent during November/December, but as a gross numerical incidence more patients within the LWfA category were diagnosed as such in the first four months of the year. As the reason for the decline in patient visits to the hospital during the course of the year (see tabulation p. 4) is not known, it is difficult to reconcile the divergence of the two distributions; however, an informed reader might draw a range of conclusions based on alternative assumptions.

The 27 percent of patients who were diagnosed as LWfA are not evenly distributed by age category. Scrutiny of the graph below will show that children in the age category 0-5 months suffer generally least with respect to weight for age, while children in the category 18-23 months exhibit the highest incidence of LWfA<sup>1)</sup>.



1. See Watts, H.L. and Lamond N.K. op. cit., p.31.



If this distribution reflects a trend in the population as a whole; then the serious situation where approximately 40 percent plus of two-year olds who appear to be undernourished is relevant. Further, it appears that a substantial number of children as a proportion of all patients suffer an adverse weight diagnosis between the ages of 18 months to 5 years (cut off in this study); an extended period of at least  $3\frac{1}{2}$  years during which many are probably malnourished. Further, the rapid increase in the percentage of patients diagnosed as LWfA after age 6 months suggests the possibility that early weaning accompanied by nutritional neglect of the infant or young child is responsible for a high proportion of low weight cases. Watts and Lamond comment that early weaning occasioned by the imminent arrival of another sibling together with possible neglect of the child and/or incorrect feeding are contributory factors to the incidence of malnutrition.<sup>1)</sup>

In general, patients who rely on a mother as chief breadwinner in the family show a higher incidence of LWfA than patients who rely on fathers or other kin in this regard. However, a mother as the chief breadwinner in a family occurs only in 4 percent of cases; in this instance 198 mothers with 75 children diagnosed as LWfA or 38 percent LWfA as opposed to 27 percent LWfA where the father is the chief breadwinner and 23 percent in the case of other kin. Employment has a limited influence on the incidence of LWfA, manifest in a polar distribution.

---

1. Watts, H.L. and Lamond, N.K.: op. cit., p.30.

Routine non manual, skilled/semi-skilled manual and unskilled labour categories show a small range of difference regarding LWfA of children; 2 percent, with an average of 27,4 percent. However, children, where the breadwinner is a clerical employee are recorded in the LWfA category only in 20 percent of cases. At the other end of the pole children where the breadwinner is unemployed (sic) or pensioned are judged to be below the 3rd percentile WfA in 34,8 percent of cases.

The availability of cash income in the homes of patients visiting the hospital is not associated with a differential incidence of LWfA, except to a degree where in the category "no cash income" a greater percentage of children are diagnosed as LWfA. Table IV shows the relatively even distribution of cases recorded as below the 3rd percentile in relation to cash income.

The lack of a cash income in the home of a patient results in 8 percent more patients in this category being diagnosed as LWfA compared with a modal category in receipt of between R10 - R14 per month. However, a wide distribution of cash income, approximately R5 - R38-50 has apparently little influence on incidence of LWfA and no influence above the mean cash income. Three reasons for this lack of association between cash income and the incidence of LWfA might be tentatively advanced:

- i) The wide range of family size (see table V below) probably obscures differences in cash income. Only where dependency ratio is low and cash income high will there be a potential for spending more cash on food. Even this is not certain as increase in income in a family often results in greater demands being made on that family from the network of extended kin. 1)

---

1. Schlemmer, L. and Stopforth P. 1974 (in press) Poverty, Family Patterns and Material Aspirations Among Africans in A Border Industry Township. Institute for Social Research, University of Natal, Durban. (MS.p.15)

Table IV Distribution of Cases recorded as below the 3rd Boston Percentile weight for age associated with level of cash income available in the homes of patients.

Level of Income	N*	% below 3rd Percentile
No cash income	166	34
R1-R9 Category below $\bar{X}$ income interval	1407	28
<del>R10-R14</del> $\bar{X}$ income = R13-64	2090	26
R15-R90 Category above $\bar{X}$ income interval	1073	26

\* No information = 97

N = 4833

- ii) Further, a mean cash income of R13-64 falling within a modal interval of R10-R14 is low by any standard. It might well be that increases to this mean are insufficient to allow increased expenditure on food and a situation arises where minimal increase to depressed incomes merely seems to broaden the base of subsistence. 1)
- iii) The above situation, if credible, might be exacerbated by a socio-cultural complex in response to social change: that is to say, while traditional standards are applied to source, type and supply of food for a family and where these are objectively no longer viable options, nevertheless cash income is reserved for material consumption related to modern aspirations - clothing, household effects, personal expenditure, etc. 2)

As regards the effects of family size and numbers of adults and children dependent on cash income available in the home, the principle of saturation seems to operate, i.e., increase in income probably means more than one cash earner and correspondingly more adults and possibly more children dependent on that income. Table V indicates that number of adults in the home has a marginal, if any, effect on the likelihood that children will be malnourished. The question of number of children in the home is equally indecisive. The most that might be said here is that children in very small families where the breadwinner has a reasonable cash income are marginally less prone to be undernourished. However, it is merely a difference of say 24 percent compared with an overall LWfA percentage of 27.

As remarked in the previous chapter many wage earners are migrant workers. The cash income received in many homes is therefore made up largely of remittances to the rural families.

---

1. Ibid., (MS. p. 16)

2. Ibid., (MS. pp. 43-60)

Table V Distribution of cases recorded as below the 3rd Boston Percentile weight for age associated with numbers of adults and children dependent on cash income in the home.

	N*	% below 3rd Percentile
<u>No. of Adults</u>		
1	237	26,0
2	388	27,4
3 - 5	574	27,1
6 plus	80	24,3
<u>No. of Children</u>		
1	129	24,2
2	193	26,3
3 - 5	635	27,7
6 plus	306	24,4

N = 1300

\*No information = 87

There is no reason to believe that children diagnosed as LWfA are disadvantaged by the fact that their fathers are migrant workers as opposed to those children whose fathers live in the vicinity of Nqutu. The tabulation below suggests only the most marginal possible influence of fathers locally resident compared with migratory fathers.<sup>1)</sup>

<u>Breadwinner, Number of miles from home</u>	<u>N.* children recorded LWfA</u>	<u>%</u>
1-20	136	25,7
21-100	215	28,1
101 plus	829	26,4

N=4833

\*No Information = 162

#### Cases admitted as in-patients at the hospital

Of the 4833 children examined during 1972, 536 were admitted as in-patients to the hospital. Of these in-patients, 325 (no information = 14) or 60,6 percent were diagnosed as being in the LWfA category. When mothers and fathers or mothers alone are responsible, for rearing these in-patients, there is little difference in proneness to LWfA. However, when other relatives have this responsibility (although numbers are small) the category incidence of LWfA rockets, siblings being least

---

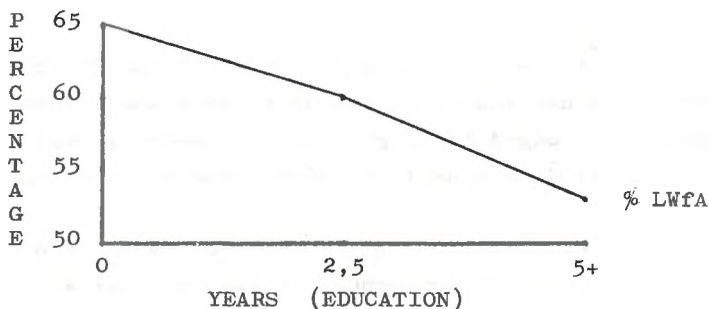
1. Watts, H.L. and Lamond, N.K., op. cit., p.35.  
Note that the Zulu father plays a crucial role in decision making including the desirability for seeking therapy for a child.

effective (100 percent; only 2 cases) followed by other kin (75 percent; 12 cases) and grandmothers (68 percent; 66 cases). The education of person responsible for rearing the child shows a positive trend for the efficacy of education associated with decrease in number of children diagnosed in the LWfA category. However, as the modal level of education for people rearing patients is only 3 years, the full potential of the effects of greater education do not appear in our data. The tabulation and graph below do show this effect which is substantial given the narrow range of variability in the independent categories.

<u>Educational level of person rearing patient</u>	<u>N.* Children recorded LWfA</u>	<u>%</u>
Nil	129	64,8
1 - 4 years	113	60,1
5 years plus	65	52,9

N = 536

\* No Information = 26



Medical personnel were required to judge whether alcoholism or the "present" then availability of food in the home contributed to any diagnosed disease or diseases suffered by a child. The judgement on the condition alcoholism in the person rearing the child and its contributory association with LWfA is inconclusive and the judgement is probably subjective. Of the 60 cases judged to be suffering from alcoholism only 56 percent of children were diagnosed as LWfA, while in 430 cases where alcoholism was rejected as a contributory factor 61 percent of children were so diagnosed. The availability of food for the household shows a positive trend where greater food resource is associated with decrease in LWfA diagnoses. A tabulation on the basis of an ordinal scale of judgement below shows this trend:

<u>Availability of food</u>	<u>N.* Children recorded LWfA</u>	<u>%</u>
Most inadequate	33	77
Inadequate	146	63
Adequate	102	55
Good	13	54

\*No Information = 51

It is as well to note that the trend follows food inadequacy rather than food adequacy: even where food resources are judged to be good in a household, over 50 percent of patients appear to suffer from malnourishment.

As certain foods are considered to be associated with nutrition medical personnel at the hospital ascertained whether or not in-patients had consumed certain foods prior to their admission to hospital and the date of the last occasion where applicable. Boxes in Table VI describe these foods and the relationship between consumption of certain foods and diagnosis of LWfA.



Table 12 Relationship between consumption of certain foods prior to admission and diagnosis of weight for age recorded below the 3rd Boston Percentile.

Consumption of food prior to admission.	Patients diagnosed as falling below 3rd Boston Percentile											
	FOOD		Meat or fish		Dried Beans or Legumes		Fresh greens		Milk Powder		Eggs	
	TIME	N	%	N	%	N	%	N	%	N	%	
Less than 1 week	170	58	129	56	136	55	222	60	80	60		
Less than 4 weeks	48	55	73	64	57	61	25	64	60	62		
Less than 2 months	7	70	7	47	9	82	8	89	2	33		
Never	68	69	83	65	88	69	34	48	146	60		
No Information	49		49		55		48		56			

N=536

Two things may be immediately noted from the distributions in Table VI.

- i) Substantial numbers of children never consume certain foods judged to be desirable for adequate nutrition and if they have failed to consume any such food one month before admission to hospital it is likely that they shall never consume such food in the age group 0-5 years. (see row of stub "Less than 2 months" and stub "Never")
- ii) It is further apparent that of children who have consumed desirable food shortly before admission to hospital that the amount of each food consumed must be very small and/or very irregular: this is inferred from the high incidences of LWfA diagnoses existing even in the most favourable category for food consumption. The relative non-differentiation of LWfA about the independent time category suggests that consumption of the foods detailed in Table VI is generally low with a general index of 61 percent LWfA diagnoses as part of the consequence.

As the categories "Less than 1 week" and "Never" for the time variable are numerically reasonably large it might be profitable to test whether recent intake of certain foods (quantity and regularity unknown) on the one hand and nil consumption of such foods on the other is positively associated with LWfA diagnosis. If the association is insignificant in any case then we would infer that intake of food over the period stipulated is so small as to have negligible effect on the nutrition of the patient. On a test of proportions based on values of Zubin's  $t$ <sup>1)</sup> it

---

1. Marsh, R.W. 1967. "Tables for testing the Significance of Difference between Proportions". Australian Journal of Psychology. 19, 3, 223-229.

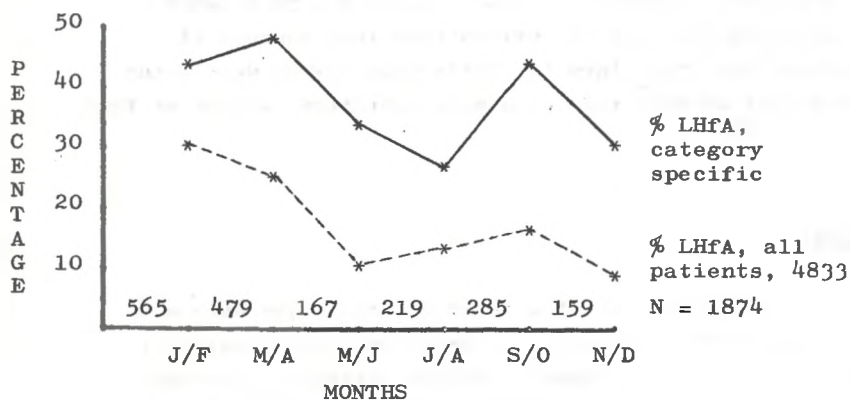
transpires that the proportionate difference in consumption/non-consumption of meat or fish is significant ( $p < .01$ ) and for the proportion involving green vegetables ( $p < .05$ ). Consumption/non-consumption of the other food-stuffs does not show a statistically significant difference. It is worth remarking that although 360 patients had consumed milk powder in the week prior to admission, either the quantity or method of intake must militate against any goodness that can be derived from this source: it would be cause for alarm if costly milk powder were being incorrectly substituted for a more nutritious source of food.

#### HEIGHT

While weight of a child may fluctuate over a short period of time due to a number of causes, height is more stable in that change is in one direction, increase, which reflects the accumulative state of nutrition of the child; 18<sup>7</sup>/<sub>4</sub> or 39 percent of children 0-5 years examined during 1972 fall below the Boston 3rd percentile height for age, a proportion considerably higher than the 27 percent below the 3rd percentile weight for age. If the criterion of low height for age (LHfA) is a more accurate indicator of malnutrition than LWfA then the broad base of malnourished children examined by the hospital must be considered to approximate 40 percent rather than the approximate 30 percent defined by LWfA.

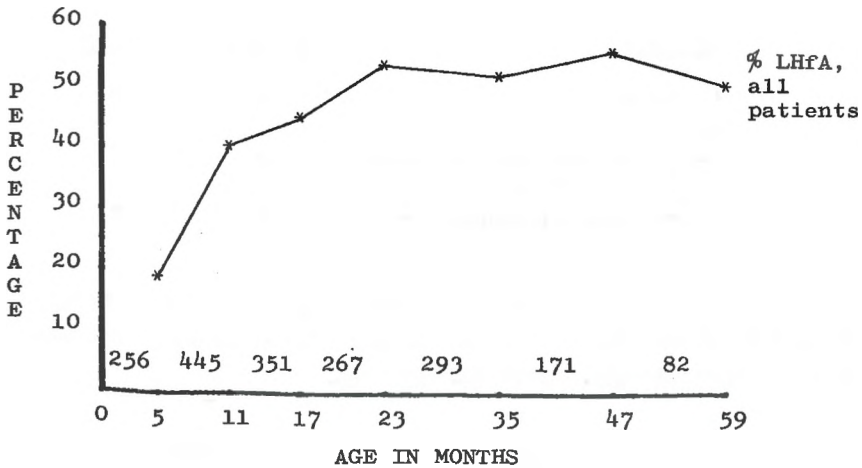
The distributions of children judged to be below the 3rd percentile height for age during 1972 does not accord with the periodic distribution of LWfA. Firstly, the percentage distributions of LHfA, both when all patients

and only LHfA patients are considered, do not diverge to any great extent and show greater stability on this variable than do percentages for weight, confirming our earlier assertion that height statistics reflect relative health and morbidity among patients, if not a population, in the long term.



However, the graph above, as well as the graph for weight should be viewed with some caution: scrutiny reveals that periodic decrease in examinations reported from the hospital coincide with decrease in LHfA diagnoses, suggesting some unknown selection factor operating in periodic visiting and incidences recorded.

More certain is the distribution of LHfA for the different age categories used below and which corresponds to similar data for weight.



LHfA, as with LWfA, peaks as a percentage at 2 years of age. However, this peak involves over 50% of patients (compare weight over 40 percent) and the condition is stable over a minimum period of 3 years. If 50 percent of patients can be judged to be definitely undernourished on the criterion of height it is probable that many more are in fact undernourished though not with sufficient severity to reflect in height indices. It may also be noted that LHfA is more prevalent (10 percent greater) among the age category 0-5 months than is LWfA.

As with the data for weight, LHfA is more manifest when a child's mother is the chief breadwinner in the home. Again, employment exercises a similar influence on LHfA, except that the incidence of LHfA judgements are generally higher for each employment category:

<u>Employment</u>	<u>% LHfA</u>	<u>% LWfA</u>
Clerical	29	20
Routine non-manual Skilled/semi-skilled manual Unskilled labour	36	27
Unemployed or Pensioner	42	35

It is clear that stunting is as prevalent among the children of clerical workers as LWfA is among relatively less-skilled employment categories.

The influence of a cash income and amount of income on the percentage incidence of LHfA is less than that recorded for weight statistics. Children, where cash income exceeds the mean of R13-64, do not derive any benefit from this increase and at a percentage of 38 percent stunted patients (mean and above mean cash income) this category is only marginally better off than patients below the mean, recorded as 40 percent LHfA and patients where there is no cash income at 43 percent LHfA of the total "income" (sic) category. Reasons for the lack of co-variation of these two variables would be similar to the reasons outlined for a similar lack of association regarding weight and cash income (see text p. 22.)

Once again the distribution of LHfA against numbers of adults and children in the home is similar to that for LWfA in that the number of people in the home do not predispose children to greater manifestations of undernourishment as the size of the family increases. The distribution merely reflects that there are more stunted than underweight children among patients examined.

The migratory status of the breadwinner and any influence this might have on the health of infants and children is very marginal when percentage LHfA incidence is considered. The marginal influence of locally resident fathers (1-20 miles) on better nutrition for their children is inconclusive and as supposedly locally resident fathers comprise only 10% (530) of breadwinners, the gross effect is probably negligible.

<u>Breadwinner, Number of miles from home</u>	<u>N.* children recorded LHfA</u>	<u>%</u>
1-20	183	34,5
21-100	299	39,1
101 plus	1322	39,2

N = 4833

\* No Information = 162

Cases admitted as in-patients at the hospital

Of the 536 in-patients admitted during 1972, 286 (no information = 39) or 53,4% were judged to be in the LHfA category. This is 7% lower than the figure for LWfA as in-patients but is probably accounted for by the fact that in-patients are always seriously ill, which is then reflected by a rapid reduction in weight, especially in cases of gastro-enteritis. Three hundred and fifty-seven mothers, where the father is absent, are responsible for rearing the

total of 536 in-patients and any difference associated with person rearing patient and LHfA is obscured by small numbers. The influence of educational standard of the person rearing a patient on the variable height for age is not as clear as that for weight differences. Compared with the tabulation education and LWfA, education beyond 4 years seems to exercise less influence in stunting.

<u>Educational level of person rearing patient</u>	<u>N* Children recorded LHfA</u>	<u>%</u>
nil	113	56,8
1-4 years	94	50,0
5 years plus	61	49,6

N = 536

\* No information = 39

Judgements as to whether alcoholism and availability of food contributed to LHfA reflect a range too small for either to have any real effect.

Table VII describes the relationship between the consumption of certain foods prior to admission as an in-patient and LHfA diagnoses. The findings are similar to those for weight: that is that a substantial number of children never consume the stipulated foods and those that do must in general consume very small quantities as there is no real difference within LHfA diagnosis between those that have consumed these foods and those that never have. Further over 50 percent of patients who have consumed these several foods within one week of admission to hospital are judged to be LHfA.



Table VII Relationship between consumption of certain foods prior to admission and diagnosis of height for age recorded below the 3rd Boston Percentile.

Consumption of food prior to admission.	Patients diagnosed as falling below 3rd Boston Percentile											
	FOOD		Meat or fish		Dried Beans or Legumes		Fresh Greens		Milk Powder		Eggs	
	TIME	N	%	N	%	N	%	N	%	N	%	
Less than 1 week	153	53	124	54	137	55	197	53	71	53		
Less than 4 weeks	47	53	59	52	44	47	23	59	54	56		
Less than 2 months	5	50	7	47	8	73	7	78	4	67		
Never	56	57	72	51	69	53	35	50	129	53		
No Information	49		49		55		48		56			

N = 536

Summary: Statistics on Weight and Height

1. Stunting (39 percent) is more prevalent among patients examined than low weight for age (27 percent).

2. Although the periodic annual distribution of weight for age during 1972 shows some peculiarities and given that the number of patients visiting the hospital (or so recorded) declines through the year, the gross number of patients judged to be below the 3rd Boston percentile weight and height for age is highest in the annual period January/April. This is generally true for LHfA diagnoses as a percentage of all patients as well as for the category percentage. In general low weight and height diagnoses are made less often during the winter months, possibly corresponding with availability of food after the summer harvest as far as weight statistics are concerned.

3. At age two years approximately 40 percent of patients examined are judged to be below the 3rd Boston percentile weight for age and approximately 50 percent below height for age. It has been suggested that early weaning and subsequent neglect and/or incorrect feeding are contributory factors to infant malnutrition.

4. In general the small proportion of children who have mothers as chief breadwinner in the family are more prone to undernutrition.

5. In general, children of clerical employees have slightly more chance of being better nourished than children of other workers and least chance when the breadwinner is unemployed or pensioned.

6. The range of cash income (mean R13-64) available in homes of patients examined exercises little influence of incidence of manifest undernutrition. Although the range

of income is quite large the absolute amounts are very small.

7. Family size does not influence the percentage incidence of undernutrition of patients examined.

8. Migrant worker status of most breadwinners compared with locally resident breadwinners has little adverse effect on undernutrition.

9. Patients admitted to hospital are more likely to be underweight than stunted.

10. Fewer in-patients are judged to be underweight or stunted where the person rearing them has in excess of 4 year's formal education.

11. Even when availability of food is judged by medical personnel to be good in a family, over 50 percent of in-patients are diagnosed as underweight.

12. In general the consumption of meat or fish, dried beans or legumes, fresh greens, eggs and to some degree milk powder is very irregular and of very small quantity. As a rule even when children have recently consumed such foods (with the assumption that this might have been reasonably regular) over 50 percent of these in-patients are judged to be undernourished.

13. The statistics show, except in a limited number of cases and instances that socio-economic standards are very low, the incidence of manifest undernourishment is very high so that in consequence many variables which are thought to exercise an influence on nutrition and undernutrition show only marginal effects in this study.

However, having made the point that under-nourished children saturate socio-economic differences in the population and with the knowledge that not all malnutrition diseases e.g. Kwashiorkor, are necessarily associated with underweight it seems wise to focus attention on clearly diagnosed cases of malnutrition admitted to hospital at this stage. Where malnutrition disease is clearly diagnosed for in-patients the variables in Table VIII show a clearer picture than the statistics above. With the exception of alcoholism, which does not seem on these data to be a problem in the district (most men away), the other variables, lack of cash income, lack of education, lack of dietary understanding and special food, are significantly associated with malnutrition diseases. Two cautionary notes however:

- i) The scaled judgements have little standardization and might very well reflect subjective impressions or prejudices of several medical personnel
- ii) Although the differentiation in terms of relative importance shows consistent scaling on the variables (alcoholism inverted) more judgements of secondary, minor and no importance are made on three variables than major importance associated with malnutrition. This suggests that in addition to lack of cash income, dietary ignorance and non-availability or non-use of special foods the possibility exists that many children might fall prey to malnutrition due
  - a) to lack of food from agricultural sources and
  - b) lack of protein sources in food available from present agricultural activities. It is clear that special foods (e.g. powdered milk) cannot be provided on any adequate scale from retail sources when the mean per capita cash income per day (calculated for patients' families) is equal to 6,3 cents.

Table VIII Admissions with clearly diagnosed malnutrition :  
 The relative importance of "key" variables associated with malnutrition condition as scaled by medical personnel (informal criteria) expressed as a percentage.

Scale \ Variables	Lack of Cash Income	Lack of Education	Alcoholism	Lack of dietary Understanding	Special Food
Major importance	48	41	5	54	46
Secondary importance	27	37	7	28	34
Minor importance	20	19	14	15	10
No importance	2	4	74	4	10
Number	329	333	275	331	272

CHAPTER IIIGENERAL MORBIDITY IN NQUTU

The incidence of primary diagnoses made for patients 0-5 years examined during 1972 is reported in Table II. As more than one diagnosis is possible for any patient, and indeed some patients manifested more than one disease on examination, tabulation of diagnoses (including healthy child) exceeds the number (4833) of patients examined and is referred to here as "multiple primary diagnosis". Fig.1 describes the percentage distribution of respiratory disease, gastro enteritis and malnutrition during the months of 1972. From Table II it is apparent that approximately 25 percent of children examined can be described as healthy. This needs qualification. The most numerous age interval visiting the hospital is of those children 0-5 months; of these 35 percent are described as healthy. However by age 12-23 months this percentage has decreased to 15 percent healthy diagnosis. This is only to be expected<sup>1)</sup> given the fact that age distribution of patients is skewed toward infants.

- 
1. It is clear that many infants in the age category 0-5 months are brought to the hospital on a routine basis after birth. Most of these children will be breast-fed at this stage and it is probable that many children subsist with normal health. Visits to the hospital among older children will no doubt reflect selection of ailing children, hence the percentage decrease in healthy diagnoses.

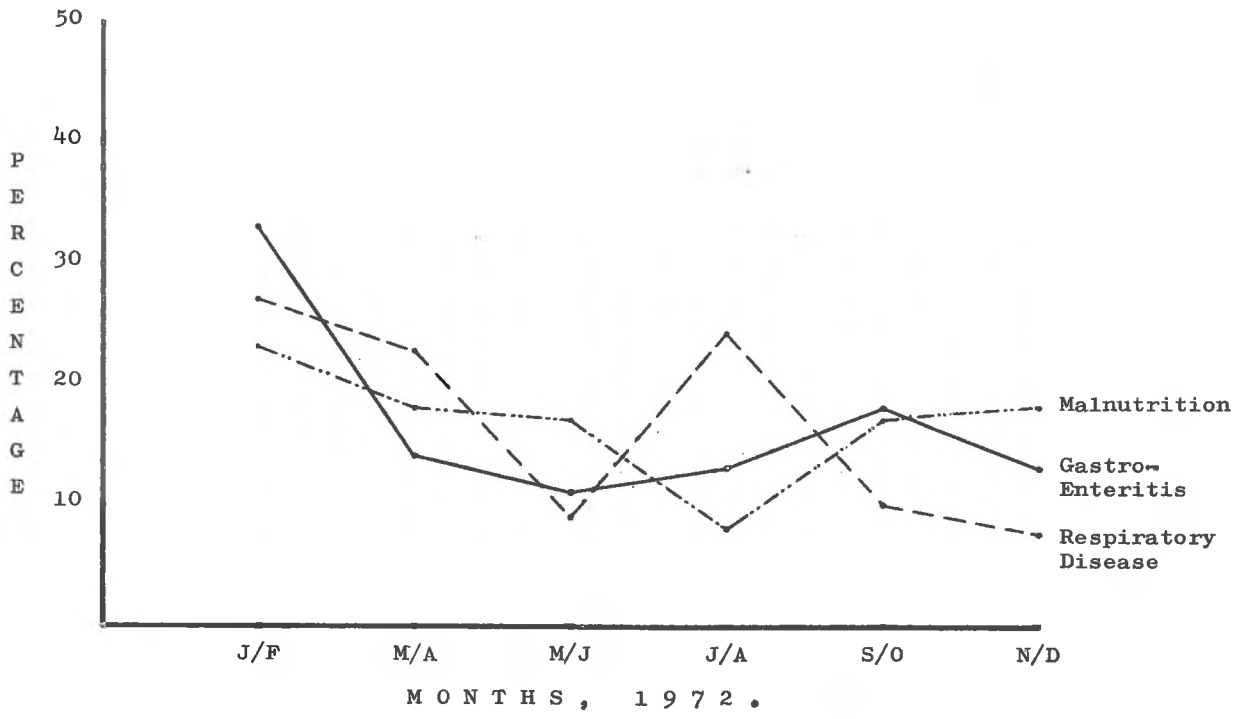


Fig. (i) Percentage distribution of three diseases during the months of 1972.

Respiratory ailments are the most common diseases treated at the hospital; 31,4 percent of all patients suffered from respiratory disease during 1972. Gastro-enteritis takes a toll of 12 percent of patients followed by malnutrition (excluding low weight and height categories) which is diagnosed in 8,9 percent of patients (431). The incidence of Trauma is comparatively high at 8,3 percent but declines in importance after age six months - approximately 50 percent of all Trauma cases occur in the age interval 0-5 months. It is as well to state that 4 percent of all children are parasytic. Scanning the information of multiple primary diagnosis cross-tabulated with status of breadwinner two observations are important. Where the mother is chief breadwinner, 17 percent of all children suffer from malnutrition as opposed to 8 percent where the father is chief breadwinner; in the case of Trauma a greater percentage of children who are dependent on other kin, rather than fathers or mothers are recorded here.

It has already been shown that the incidence of undernutrition peaks at age two years. Expressed as a percentage of the various age categories this is also true of malnutrition disorders which reflect a broader peak from 12-23 months. Further, incidences of the occurrence of respiratory disease and gastro-enteritis build up to a peak from age 6 months to 23 months. Differences in status of employment have little if any influence on the incidence of diseases considered in this report. Similarly the narrow range of cash income is not sufficient to show any influence on distribution of disease.

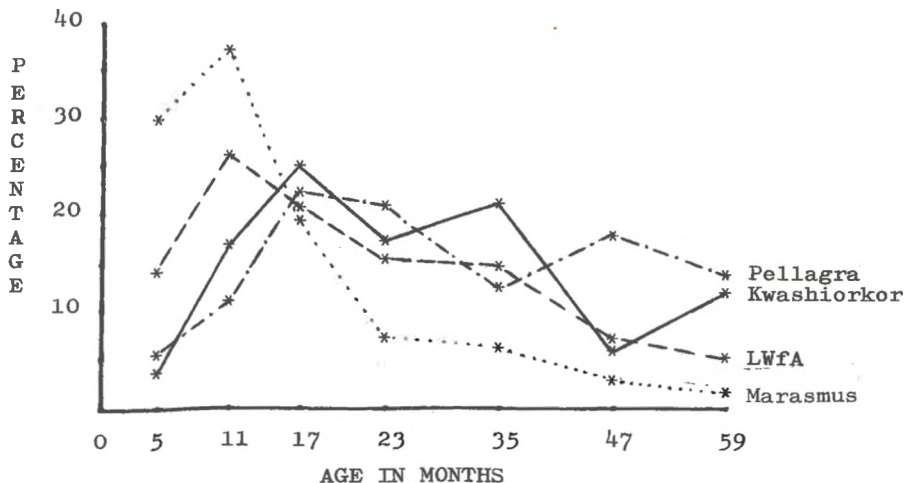


Of the 536 in-patients admitted during 1972, 30 percent suffered from malnutrition, 20 percent from respiratory disorders and 17 percent from gastro-enteritis. However, as a percentage of all diagnoses of each disease malnutrition accounted for more admissions.

	<u>%</u>
Malnutrition cases admitted	38
Gastro-enteritis cases admitted	16
Respiratory disease cases admitted	7

CHAPTER IVMALNUTRITION DISEASES

Of malnutrition diseases clearly observed and diagnosed (431 cases) Kwashiorkor (176), Marasmus (97) and Pellagra (52) occur most frequently (Table II). Rickets (25) and Scurvy (18) were also identified. Doctors judged 1471 patients visiting the hospital as below the 3rd Boston percentile weight for age (note, there is a discrepancy in the two figures given on this variable). The distributions of Kwashiorkor, Marasmus and Pellagra as well as LWfA are expressed as a percentage of the total incidence of each disorder over a range of age intervals 0-5 years in the graph below.



It is apparent that the graphs for Kwashiorkor and Pellagra show a low incidence in the first six months of life, increasing steadily till eighteen months, after which they decrease but not completely, i.e. more than 10 percent of Kwashiorkor and Pellagra cases occur at age 5 years. Marasmus, on the other hand, occurs frequently during the first six months, most frequently at 12 months when the incidence decreases sharply to two years and has all but disappeared by age 5 years. Among cases judged to be LWfA, it is apparent that undernutrition occurs frequently in the first six months of life, peaks at a year, then decreases steadily but does not disappear as an incidence by five years of age.

Once again, (although figures are small) occupational status does not influence the incidence of malnutrition; e.g. expressed as a percentage children of clerical workers are as likely to suffer from Kwashiorkor as those of unskilled labourers. We are able to reiterate that cash incomes received in the homes of patients have no influence on incidence of particular malnutrition diseases - the cash income levels being very depressed. (See earlier chapters).

Of all malnutrition cases diagnosed (30 percent of malnutrition diagnoses admitted as in-patients) patients suffering from Marasmus required most hospitalization (82 percent), followed by Kwashiorkor (57 percent), and Pellagra (27 percent). When figures are broken down to frequency admissions of malnutrition cases, we have at our

disposal a mere 204 cases (plus 27 no information cases) of which Kwashiorkor, 100 cases, and Marasmus, 80 cases, are the only categories large enough to yield any meaningful results. In the case of 69 percent of Kwashiorkor admissions, medical personnel reported that the availability of food was either inadequate or most inadequate, while the incidence for Marasmus was reported as 55 percent.

The trend throughout this report showing that consumption of foods related to improved nutrition is either very irregular or insufficient to alter the nutritional status of many children is reinforced by the content of Table IX, which describes the efficacy of consumption of these foods relating to the particular malnutrition diseases of Kwashiorkor and Marasmus. Again it can be seen that eggs are consumed by few Kwashiorkor cases and not many more Marasmus cases. It is clear from the percentages (all over 50) of Kwashiorkor cases where foods described in the table (except eggs) have been consumed during the week prior to admission, that consumption is absolutely not related to preventing disease. Again the consumption of milk powder (76 percent and 51 percent of Marasmus and Kwashiorkor cases respectively) during the week prior to admission (and possibly on quite a regular basis) must be consumed in very small quantities or be incorrectly prepared. Marasmus cases tend to fall more readily into the "never consumed" category as regards meat or fish, dried beans or legumes and fresh greens but it must be recalled that Marasmus arises from total dietary deprivation, including carbohydrates, (mostly during the first year of life from our data) so that lack of intake of protein and greens merely tends to reinforce the causes of the disease.

Table IX Relationship between consumption of certain foods prior to admission and diagnosis of Kwashiorkor and Marasmus expressed as a percentage of each disease.

Consumption of food prior to admission.	FOOD	Meat or fish		Dried Beans or Legumes		Fresh Greens		Milk Powder		Eggs	
		K	M	K	M	K	M	K	M	K	M
Less than 1 week		56	31	50	19	52	23	51	76	13	20
Less than 4 weeks		21	20	21	30	16	21	8	6	17	20
Less than 2 months		3	1	7	0	4	1	4	0	2	0
Never		17	35	18	40	23	44	31	6	63	46
No Information	N	3	10	4	9	5	9	6	9	5	11

K = Kwashiorkor

M = Marasmus

In any event, those consuming these foods more regularly must do so in very inadequate quantities to suffer from total dietary deprivation.

Scaled judgements of medical personnel as regards the importance of certain variables related to Kwashiorkor and Marasmus in particular (Table X) are similar to the results reported for all malnutrition diagnoses in Table VIII. In Table X (although in some instances cases for which there is no information are many) the major importance of lack of cash income, lack of education, lack of dietary understanding and the non-availability of special foods, are recognised by medical personnel as contributing to both Kwashiorkor and Marasmus most often in terms of the scaled alternatives. Alcoholism is judged to play very little part as a contributory cause of malnutrition. However, taking the alternatives "minor importance" and "no importance" together, the cells indicate that malnutrition disease (particularly Kwashiorkor and Marasmus) occurs even where there is a relative understanding of nutrition and availability of money (although the amount of cash is probably very small by absolute standards).

**Table X** Admissions suffering from Kwashiorkor and Marasmus :  
 The relative importance of "key variables" associated with Kwashiorkor  
 and Marasmus as scaled by medical personnel (informal criteria) expressed  
 as a percentage of each disease.

Variable Scale	Lack of Cash Income		Lack of Education		Alcoholism		Lack of Dietary Understanding		Special Food	
	K	M	K	M	K	M	K	M	K	M
Major importance	40	34	34	36	7	3	55	46	43	21
Secondary importance	26	10	32	20	3	3	21	21	21	21
Minor importance	17	21	23	16	6	10	14	4	3	8
No importance	4	5	2	3	61	48	2	3	8	9
No information N =	13	24	9	20	23	30	8	21	25	33

K = Kwashiorkor  
 M = Marasmus

CHAPTER VCONCLUSION AND COMMENT

1. If it is accepted that infants and children who fall below the 3rd Boston percentile distribution of weight and height for age constitute a manifestly undernourished population component and that undernourished individuals can be precipitated into florid malnutrition by a variety of causes (e.g. inter-current infection, drought, loss of a breadwinner, birth of another child in the family), then, on the basis of hospital records, the outlook for cumulative malnutrition among infants and children in the Nqutu district is bleak. Firstly, infection is relatively rife,<sup>1)</sup> including a high incidence of respiratory disorders and gastro-enteritis (with some incidence of T.B. and parasitism) over and above childhood diseases. Secondly, the socio-economic standards in the area are so low that any adverse change in agricultural production could be disastrous in its effect on malnutrition: almost certainly many undernourished children would succumb to a florid form of malnutrition and marginally-nourished children would become undernourished in the short term with all the prospects for malnourishment in the long term. It is posited that this closed spiral can be influenced downward (toward malnutrition) by small adverse changes in food sources while it would require relatively large positive

---

1. See Text p.12, where the incidence of inter-current respiratory disease relating to the question of potential malnutrition disorders is discussed.



changes in food supply to reverse the trend to equitable nutrition on the basis of our findings that consumption of certain crucial foods is already at a level so low as to have little influence on undernourished and malnourished conditions. Thirdly, family size in the area is large. If malnourishment is a feature of adult as well as infant life, then as malnourished-families produce more children than normally-nourished families,<sup>1)</sup> large families will continue to be a feature of the area, exhausting food resources, cash incomes and depriving penultimate infants in the family (due to early weaning) of adequate nutrition and care.

The independent influence of increasing family size on malnutrition can be substantially eroded by changes in socio-economic conditions; that is, large family households or domestic units can improve their food consumption in both quantity and quality given certain changes in socio-cultural orientation and more money. In a recent study of comparative food consumption among selected households at 1958 and 1972 in a homeland area in proximity to Botha's Hill,<sup>2)</sup> and consequently close to the Durban-Pinetown urban/industrial complex, the following findings were reported:

- (i) family households had increased in size by 74% on average in the intervening 14 years;
- (ii) household food consumption appears to have improved during this period and significant changes in consumption of more nutritious food was apparent; and

- 
- 1. Reid, J.V.O., op.cit., p.24.
  - 2. Study prepared by the Institute for Social Research in collaboration with The Valley Trust. A manuscript entitled "Socio-cultural Background and Household Nutrition Among Africans in the Vicinity of 'The Valley Trust', Natal" has been completed and is being considered for publication by the Institute during 1975.

- (iii) this unexpected improvement has been attributed, inter alia, to greater cash income from migrant labour, greater supply of food in retail outlets and influences of urbanization - to the extent that the area of the "Valley" studied can be described as peri-urban.

This appears, except for the large family sizes, to be the opposite of what has occurred in the Nqutu area. A recent descriptive study in the area<sup>1)</sup> leaves the impression that socio-cultural and economic conditions are as adverse in general as we have been able to show from an enumeration of hospital records (biases discussed on p. 2).

2. Analysis of data at our disposal shows clearly that socio-economic conditions are so depressed in Nqutu that in most cases differences in socio-economic variables exercise very little or only marginal influence on the incidence of undernutrition and malnutrition. This is true both of general family circumstances as well as the more physical conditions of consumption of desirable foods. Given that the most predictive solution to problems such as malnutrition, over-population, ignorance, non-participant social styles, etc., is improving socio-economic standards among a population, then the population of Nqutu has little chance of realizing such an improvement even with state aid. Most breadwinners from our "sample" of patients are migrant workers who probably do not remit more than a fifth or quarter of their incomes to the rural area (this is, and has been, a standard proportion). Most African rural areas in South Africa are over-populated. Agricultural production is seldom rational and in many cases this is aggravated by the absence of the labour and authority of males. The

---

1. See Clarke, L., and Ngobese, J. Undated (1975), Women Without Men. Durban, Institute for Black Research.

problem of underdevelopment therefore appears to be one of circulatory reinforcement. One solution to this problem is a more equitable allocation of people to urban and rural areas in South Africa. The migratory labour (or partial settlement in towns) system is at the seat of the problem. Were families to reside in the urban areas where men are working the income received by the worker would be more evenly shared by the members of the conjugal unit with especially a greater chance for better nutrition for infants. Although complex carbohydrates remain predominant in the urban African dietary, a medical study has shown that a semi-western pattern is emerging<sup>1)</sup> which is probably more nutritious than dietaries in very depressed rural areas. The pattern described in the medical study is not dissimilar to the food consumption pattern of the "Valley" area mentioned earlier which is certainly more nutritious now than it was in the 1950's. If the towns were to absorb more of the population (and population increase) in this way this would open the way for more rational use of land in the rural area. It is also generally true that urbanization of a population contributes significantly to social change and exposes a population to "modern" standards. At this very time it can be seen that urban industrial workers are able to influence their material situation in a way that is impossible in the rural area.<sup>2)</sup>

3. The thesis immediately above, i.e., that relative depopulation of the rural area will lead to better nutrition

- 
1. Manning, E.B., Mann, J.I., Sophangisa, E. and Truswell, A.S., 1974. "Dietary Patterns in Urbanized Blacks: A Study in Guguletu, Cape Town, 1971". Supplement to the South African Medical Journal. 48, 12, 485-498. (p.493)
  2. Cf the recent policy of the Wage Board to grant significant increases in wages to urban African workers in the wake of informal industrial action.

among subsequently urbanized Africans as well as Africans on the land in the long term, begs numerous questions involved in the sociology of change and transition (not least the economic re-organization that such a change will precipitate but which is not commented on here). However, given differential rates of change among urban and rural settled African populations (more rapid among urban Africans) and the notion that traditional family institutions and structures are the most resistant to change and a contributory factor to under- and malnutrition, then two theoretical positions can be advanced for the probably efficacy of reversing the trend of de-urbanization in South Africa (i.e., the fact that rural areas absorb more of the African population increase than do towns and cities).

#### Malnutrition and Urbanization

Removal from one physical environment to another does not necessarily pre-ordain radical changes of social structure - this is particularly true of South Africa where rural to urban shift is discouraged and family settlement in urban areas, where it is achieved, is tenuous. However, as we are concerned with a possibility where settlement might be encouraged at some future time, we proceed undaunted. Likely changes that accompany urban settlement of Africans include the following:

- (i) A breakdown of traditional kinship reciprocal obligations within extended family and clan structures.
- (ii) A tendency to nucleation of the conjugal unit in town.
- (iii) With demonstrable failure of a security system based on kinship, a volition to "modern" systems of security based on material standards and consumption.

- (iv) Given the above, a consequent shift from group to self-reliance in an industrial system where the resources of the wage earner are reserved for security and use of the elementary family.

Accepting the view that in general urbanization effects some positive changes in African dietaries, a prognosis such as the above does not mean that nutrition among infants and children will be automatically improved in town. In fact, we discovered recently that dietary aspirations among Africans in a border industry township were very modest in comparison to aspirations to other forms of material consumption (however, actual diets would be more substantial than those generally pertaining in rural areas).

The results of a small random sample survey of households in the township of Umlazi, conducted by the Institute for Social Research,<sup>1)</sup> directs attention to the vital question of knowledge and beliefs and their association with child nutrition. Only eight out of seventy-five women interviewed (six with secondary, two with primary education) were able to demonstrate an understanding of the connection between food, nutrition and health.

In answer to the question posed by an experienced interviewer in Zulu: "How can the food one eats affect a person's health for better or worse among children?" the overwhelming majority of subjects who were not bewildered by the probe replied variously:

---

1. These findings from the Umlazi survey are reported in Schlemmer, L. and Stopforth, P. 1975, "Nqutu - the Malnutrition Story", Sash, 17, 4, 5-8. (p.7)

- it depends of the digestive system;
- it depends on bile;
- food may be bad for blood;
- it depends on the worms you have;
- it depends on the big worm; or
- some food does not agree with children.

Clearly child health is not centrally associated with the nutritional value of food. As about 90% of respondents in Umlazi have recourse to partial or complete reliance on inyangas and other traditional or "spiritualist" practitioners, it is most probable that the causes of disease are conceptualised as occurring as a result of socio-spiritual disorder or as a result of toxic influences and are not related to modern concepts of disease and nutrition.

This state of beliefs and knowledge and the reliance on traditional remedial practice with respect to nutrition and health describes the situation in a modern urban setting.

One respondent summed up the disdain of many Africans for attempts by White agencies to change established or "sacred" eating practices and customs when she said: "Ask the Whites - they are preaching about it daily."

It is commonly known that diet and customs of eating are the social patterns most resistant to change. If the above is true for urban Africans, then how much more compelling is the need for appropriate health education among the rural people of an area like Nqutu? In our unpublished study of the "Valley" area near Botha's Hill, it is reported that nutrition education by The Valley Trust (an organization dedicated to the promotion of health during the last 24 years) has had the effect of improving infant

and child nutrition. This effect appears to be the consequence of some conceptualization of the relationship between food and health (via The Valley Trust teaching) not apparent in a Durban African township. The effect can also be associated with improved socio-economic conditions in the area and with increasing urban invasion of previously rural settlement. It would appear that health education is more efficacious if certain socio-economic conditions can be met - conditions not apparent in Nqutu. It might very well be that health education alone in Nqutu would prove to be an ill-directed strategy.

Notwithstanding these qualifications, at the very least such a set of socio-economic conditions would favour the more usually suggested solutions to malnutrition (nutritional supplements, education, subsidies, handouts, etc.). Unfortunately, although such a re-organization of population would go some way to improving not only malnutrition but other ills associated with adverse socio-economic construction, the proposal requires the political acquiescence of groups whose interests appear to focus on racial and urban/rural duality. It would appear that in South Africa greater relative ruralization of the African population is envisaged by the authorities.

#### Malnutrition and Rural Depopulation

Even in the event of a major rural to urban shift, a most unlikely situation in South Africa at present, the real problems of social change in the depopulated rural area would be far more difficult to surmount than change associated with urbanization. Change within a social system is notoriously more difficult than the change from one order to another. However, the conditions arising from depopulation would allow more flexibility in the structuring of

rural society.

- (i) The extended family system which is associated with high dependency rates, conservative outlook and dependence on female labour could not survive under the strain of depopulation.
- (ii) Farming could develop into a cash-crop industry rather than a subsistence mode where men would be more active in a productive capacity.
- (iii) Certainly the income from farming would improve if land allocations could be made on the basis of economic units.

The great stumbling block to the theoretical implication for the rural pole of this model is that status and leadership would have to be re-orientated in order to facilitate the emergence of leadership geared to cope with the modern world; leadership based on modern rather than traditional prescriptions. Certainly, any depopulation of the rural areas will improve the standard of nutrition of the people on the land.

4. The unlikelihood in the near future of the implementation in Nqutu of political and economic changes necessary both to distribute people more equitably between urban and rural settlement and to accelerate rural development, requires that the present realities be more fully understood. It is not only poverty that causes malnutrition but a complex of factors which adhere to the poverty/malnutrition syndrome, in many instances both as causes and effects of the total process through time.

Further afield, findings of a study in Britain add a further dimension to the question of poverty and its relation to child-health. Mary Brennan of the Department of Social Medicine at the University of Birmingham,<sup>1)</sup> has

---

1. Reported in New Society. Vol.28, 27th June 1974. (p.770)



shown that social stress in the family is associated with stunting, low weight for age, poorer vision and impaired hearing among children.

The finding is consistent even when controlled for income and social class. The inference is one of neglect resulting from poor morale.

In an area like Nqutu, the effects on family morale and child care of appalling socio-economic conditions and disrupted family life must be very considerable. Given the ignorance about the causes and nature of malnutrition, the effects of poverty and social stress are magnified.

Socio-economic conditions in the Nqutu district are so depressed that variables that could be expected to affect the incidence of undernutrition and malnutrition do not seem to relate in any significant way to the extent of the problem.

For example, the upper limits in range of cash income in the homes do not exceed roughly R40 a month in the Nqutu study. The vast majority of families, therefore, even the relatively less impoverished, are trapped in a descending spiral where few priorities can be effectively met from cash income, and in addition, food, the ultimate necessity, probably has a relatively low priority as an item of cash expenditure.

While standard of education has a marginal effect on the most consistent indicator of stunting, even five years of education (in the person rearing the child) is generally not sufficient to effect an appreciable improvement in child health.

In any event reliance on education per se to

irradicate malnutrition is probably not feasible. The educative or socialising process has to be integrated with the influence of other institutions in society. No amount of dietary understanding can combat the adverse socio-economic conditions which are typically present, nor will education, in isolation, necessarily effect changes in long-established eating customs or provide the springboard to new motivations regarding nutrition and health.

The factor of dietary ignorance is, however, sufficiently powerful to be regarded as a primary influence in precipitating malnutrition among children in a context of widespread and uniform poverty. Even where nutritious foods were available to the child we found that intake was probably both insufficient and too irregular to maintain health.

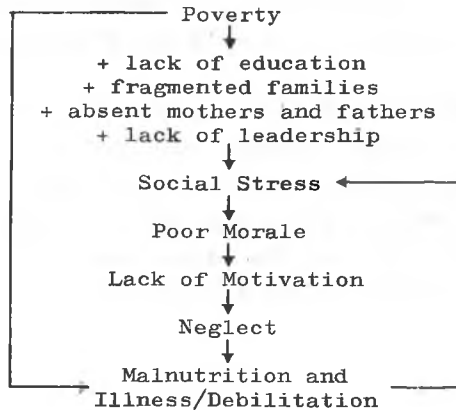
The obvious misuse of milk powder (usually incorrectly mixed) is an example of the very likely failure of modern inputs into a traditional system. Clearly a very fundamental and comprehensive sociologically-based approach to health is required, both in urban and rural areas of the Republic.

Traditional behaviours and institutions resistant to change have to be recognised and acknowledged. Health education should attempt to reconcile such existing norms with changes taking place in the community and with "modern" health counselling in a way that will allow new institutions to emerge.

These, hopefully, will take on much of modern form while "preserving" unique and indeed "sacred" aspects of rural culture.

All remedial action directed at improving nutrition

among rural (and urban) Africans is likely to be subject to diminishing returns if it occurs in situations characterised by poor community morale and social stress. The self-reinforcing syndrome involving poor nutrition in Nqutu can be simply illustrated as:



The problem is clearly not only that of poverty. Wide social, political and cultural cleavages make the communication of health concepts very difficult.

Even Black nurses and educators may well be seen as employees of Whites; remember our one respondent's phrase: "Ask Whites - they are preaching about it daily." Given poverty and ignorance, social stress and lack of coherent, organic community leadership exacerbate an already desperate situation in terms of child health.

It certainly seems that where poverty and lack of education are pronounced, as in Nqutu, a limited alleviation of poverty or a limited increase in educational standards will operate only very marginally to decrease the incidence of malnutrition.

This suggests that community-wide deprivation has to be effectively combated by far-reaching, extensive reform before any really significant results regarding child health can be expected.

Eradication of only the more severe instances of poverty and marginal improvements in health education are not likely to be sufficient to combat malnutrition if other causes of social stress remain manifest in the community.

When considering the type of basic changes necessary it becomes obvious that what is required are intensive multi-pronged community development strategies, rooted in community participation, accompanied by a significant amelioration of the causes and effects of migrant labour and enforced separation of parents and children.

A P P E N D I X

CASE RECORD SCHEDULE

Overleaf we present a facsimile of the completed case record schedule of an anonymous child admitted to the hospital.

The completed form shows the format for the recording of information and the codes assigned to the answers for purposes of computer processing.

## MALNUTRITION STUDY

NOTE : This Form is to be completed by the Hospital or Clinic for ALL children 5 years and under attending :

HOSPITAL or CLINIC : CHARLES JOHNSON MEMORIAL HOSPITAL, NGUTU

DATE 21.6.73

PATIENT :

(4)

1. NAME	ANONYMOUS						
2. SEX	MALE <input type="checkbox"/>	FEMALE <input checked="" type="checkbox"/>	8	2			
3. RACE	BANTU <input checked="" type="checkbox"/>	INDIAN <input type="checkbox"/>	COLOURED <input type="checkbox"/>	9 1			
4. ESTIMATED BIRTH DATE	MONTH Nov	YEAR 1972	10	2			
5. WEIGHT	6.8 kg	1 2	11	1			
6. HEIGHT	62 cm	1 2	12	1			
7. CHIEF BREADWINNER	ANONYMOUS		FATHER <input type="checkbox"/>	MOTHER <input type="checkbox"/>	OTHER <input checked="" type="checkbox"/>	13	3
8. EMPLOYMENT :	e.g. specific occupation/ unemployed/ pensioner		Labourer		14	4	
9. CASH RECEIVED IN THE HOME	MONTHLY : R 18	WEEKLY : R	15	04			
10. NUMBER OF PERSONS IN THE HOME DEPENDENT UPON THIS INCOME	ADULTS 2	CHILDREN UNDER 16 5	17	2			
11. EMPLOYER'S ADDRESS	Johannesburg		TOWN/DISTRICT	19	5		

COMMENTS BY DOCTOR :

12. PRIMARY DIAGNOSIS	Gastro enteritis		20	07					
13. MALNUTRITION DISEASE CLEARLY OBSERVED	<input checked="" type="checkbox"/> 1	2	3	4	5	6	7	8	9
	1	2	3	4	5	6	7	8	9
14. OTHER ASSOCIATED DISEASES : (More than one may apply)	TB <input type="checkbox"/>	GASTRO-ENT. <input type="checkbox"/>	PNEUM. <input type="checkbox"/>	MEASLES <input type="checkbox"/>	PARASITIC INFECTION <input type="checkbox"/>	OTHER <input type="checkbox"/>	8	9	
	1	2	3	4	5	6	7	8	9
15. PATIENT HAS BEEN	ADMITTED TO HOSPITAL <input checked="" type="checkbox"/>		TREATED AS OUT-PATIENT <input type="checkbox"/>	20	07				
	1	2	3	4	5	6	7	8	9

\* If patient is admitted, please complete the reverse side of this form.

RETURN FORM TO : SECRETARY,  
MALNUTRITION STUDY,  
31, HOSPITAL ROAD, HILLCREST, NATAL

ADDITIONAL DETAILS FOR IN-PATIENTS

5 years of age and under

16. TOTAL HOUSEHOLD INCOME DERIVED FROM ..... 

CASH ONLY	CASH & KIND	KIND ONLY
-----------	-------------	-----------

27 1

17. PERSONS REARING PATIENT ..... 

Father & Mother	Mother	Granny	Sibling	Other Kin	Non-relative
-----------------	--------	--------	---------	-----------	--------------

28 2

18. SCHOOL STANDARD PASSED BY MOTHER OR PERSON REARING PATIENT ..... 

Nil	Cl 1 Cl 2	Std 1 Std 2	Std 3 to Std 5	Std 6 Std 7	Std 8 Std 9	More education
1	2	3	4	5	6	7

29 7

19. IS ALCOHOLISM IN PERSON REARING PATIENT A CONTRIBUTORY FACTOR ? ..... 

YES	NO	NOT SURE
-----	----	----------

30 2

20. PRESENT AVAILABILITY OF FOOD FOR HOUSEHOLD (e.g. due to seasonal or other variations) ..... 

GOOD	ADEQUATE	INADEQUATE	MOST INADEQUATE
------	----------	------------	-----------------

31 2

21. WHEN LAST, PRIOR TO ADMISSION, DID PATIENT EAT ?

	No. OF DAYS AGO	No. OF WEEKS AGO	NEVER	
Meat/Fish			✓	32
Dried beans/legumes			✓	33
Fresh greens			✓	34
Milk/Milk Powder + <i>lorryage + peas</i>				35
Eggs			✓	36

22. IF ANY MALNUTRITION IS PRESENT, WHAT IS THE RELATIVE IMPORTANCE OF THE FOLLOWING :

	Major importance	Secondary	Minor	Nil	
Lack of cash income					37
Lack of education					38
Alcoholism					39
Lack of dietary understanding					40
Special foods					41
Not applicable					42

SEND FORM TO ADDRESS GIVEN ON OTHER SIDE.

SUPPLEMENT

Subsequent to successful recording of medical examinations among infants and children visiting the Charles Johnson Memorial Hospital or any of its eleven satellite clinics during 1972, a replication of the exercise was attempted during 1973. Unfortunately, the return of records on the 1973 exercise was not as complete as for the earlier study and do not warrant the time or effort of a separate research report. However, as the 1972 work reported in this Fact Paper refers to a chance point in time, it might be useful to be able to confirm, qualify or reject some disease statistics on the basis of comparative work at another point in time (albeit only one year hence). To this end the comparative table below is offered now as a supplement to the prior study.

The difference in gross numbers for general diagnoses and diagnoses of clearly observed malnutrition at 1972 and 1973 in the supplementary table should not be read as a general decline in disease and malnutrition in the area. This difference reflects incomplete recording during 1973 - the reasons for this are not clear and in consequence comparison can only be stated in a tentative way. In general the incidence of disease reported for 1972<sup>1)</sup> and 1973 appears not to be greatly different. Respiratory disease, gastro-enteritis and florid malnutrition appear as the most frequent disorders during both years. The high incidence of trauma reported in 1972 is not confirmed by the 1973 data - however, as physical traumatic events are largely due to chance factors and usually do not vary, it is most likely that this decrease is due to recording bias.<sup>2)</sup>

- 
1. See text, p.7, Table II.
  2. In fact, it is suspected that many cases of trauma were incorrectly recorded as "healthy children", accounting in large measure for the increase during 1973 in the latter category.



SUPPLEMENTARY TABLE

COMPARATIVE PERCENTAGE OF DIAGNOSES MADE BY DOCTORS OF  
THE CHARLES JOHNSON MEMORIAL HOSPITAL AMONG PATIENTS  
AGED 5 YEARS AND UNDER, DURING 1972 AND 1973

Multiple Primary Diagnosis			Diagnosis of Clearly Observed Malnutrition		
Disease	1972 N = 4833	1973 N = 2460	Disease	1972 N = 431	1973 N = 278
	%	%		%	%
Respiratory	31,4	25,6	Kwashiorkor	40,8	58,6
Gastro-enteritis	12,0	8,0	Marasmus	22,5	24,8
Malnutrition	8,9	11,3	Pellagra	12,1	2,5
Trauma	8,3	1,6	Rickets	5,8	1,5
Childhood disease	4,1	5,5	Scurvy	4,2	-
Parasitism	4,0	3,7	Other	6,5	4,3
T.B.	1,6	2,0	No information	8,1	8,3
Other infections	9,9	4,8		N = 4833	N = 2460
Other diseases	4,9	5,3		%	%
Healthy child	24,7	34,7	Low weight for age	30,4	30,6
			Low height for age	38,8	40,7

In fact, it is suspected that many cases of trauma were incorrectly recorded as "healthy children", accounting in large measure for the increase during 1973 in the latter category. During 1973, kwashiorkor and marasmus incidences are somewhat higher and slightly higher than 1972 figures respectively. If this reflects true values then it can be stated that protein-calorie malnutrition is indeed a problem in the Nqutu area. Vitamin deficiencies appear to be less of a problem during 1973. As with florid protein-calorie malnutrition, indicators of undernutrition, low weight and height for age, show during 1973 the same distribution as in the earlier study.

In general, with some qualification, it can be concluded that malnutrition and undernutrition recorded during 1972 in Nqutu can be confirmed by the replicated study in 1973.



This work is licensed under a  
Creative Commons  
Attribution – NonCommercial - NoDerivs 3.0 License.

To view a copy of the license please see:  
<http://creativecommons.org/licenses/by-nc-nd/3.0/>

This is a download from the BLDS Digital Library on OpenDocs  
<http://opendocs.ids.ac.uk/opendocs/>