

Measuring and managing protein energy malnutrition in rural communities

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5 intervention results

RESULTS — 18 MONTHS AFTER THE INTERVENTION PROGRAMME

1. Mortality rate in the hospital

Mortality rate of children under 12 years of age admitted in the paediatric wards from the 1st January till the 31st of December in 1979, 1980, 1981 and 1982 is given in table V.1.

For the period of December 1981 to May 1982 the children who died due to PEM or where PEM was a contributing factor were analysed. Eleven children died where PEM was a main cause or contributing factor. Seven of them were girls, six of them were boys. Nine of the children did not attend the UFC. One was admitted in the nutrition rehabilitation ward, but after discharge the mother defaulted and took the child to a traditional healer.

2. Results of the cross-sectional Study of the Present Under Six Population.

The sample consisted of 504 children under the age of six years out of 273 households.

Mortality Rate

We found 516 children under six years of age living in the 273 households (only 504 were seen). Eleven under six children died in 1981. This gives a 0 to 6 child mortality rate of 2,1% (in 1979 it was 9,5%). We tried to ascertain the cause of death and concluded from what we were told that three children died from chest infections, 5 children died from gastro-enteritis, 2 children died from epileptic fits and 1 child died from measles.

For one child the cause of death was unknown.

TABLE V.1. - Mortality pattern of children under 12 years admitted in the paediatric wards.

	1978/79	1979/80	1980/81	1981/82
Admission in paediatric wards	1961	2329	2613	2336
No. of deaths in paediatric wards	144	140	123	112
% of deaths in paediatric wards	7,3%	6,0%	4,7%	4,8%
Attendance UFC	12500	34335	49257	69107

Mortality pattern of children under 6 years of age coming from Gelukspan ditric and admitted in the paediatric wards from the first of December till the 31st of May in the four years is given in TABLE V.2.

TABLE V.2. - Mortality pattern of children under 6 admitted in the paediatric wards in four, six month periods.

	1978/79	1979/80	1980/81	1981/82
No. of deaths from Gelukspan district in hospital	65	53	47	41
No. of deaths due to PEM and %	27 41%	22 41%	18 38%	6 15%
No. of deaths where PEM was a contributing factor.	4	12	12	5
No. of deaths where PEM was main or contributing factor, and %	31 48%	34 64%	30 63%	11 27%
Leading Causes of Death				
PEM		22	18	6
Gastro-enteritis	27	8	10	10
Prematurity	20	4	3	9
Meningitis	-	1	1	6
Chest Infection	3	3	9	2
Measles	3	10	2	
TB	2	2	-	-
Poisoning/accidents	1	-	-	4
Liver failure/Hepatitis	-	2	-	2

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Protein Energy Malnutrition

TABLE V.3. Relative Frequency of Malnutrition in the Different Age Groups in 1980 and in 1982.

AGE GROUP (months)	% Underweight Children		% Chronically maln. children		% Acutely maln. children		% Severely maln. children	
	1980	1982	1980	1982	1980	1982	1980	1982
0 - 11	13,4	6,7	6,1	17,0	15,0	2,4	-	-
12 - 23	58,9	31,0	22,2	37,9	28,1	9,2	7,9	2,3
24 - 47	56,9	29,7	20,0	35,4	40,5	4,6	4,4	4,0
48 - 71	62,1	38,3	13,6	39,9	36,8	4,3	*3,7	*2,3

* Only for the age of 48 months to 60 months.

TABLE V.4. - Relative Frequency of possession of Vaccination Card among 497 Children.

Minimum % with card	Locked away	Lost	Maximum % with card	No. Card	Unknown
83,5%	2,6%	6,0%	92,2%	7,2%	0,6%

Nutritional Status

Of the children under six, 34% had a weight for age less than 80% of the mean of the Harvard Standard. Of all the children under six years 34% suffered from chronic malnutrition as defined by 90% of the reference height for age (Harvard Standard).

Of all the children under six years, 5% suffered from acute malnutrition as defined by 80% of the reference weight for height (Harvard Standard). Of the 345 children between 12 and 60 months, 11 (3,2%) had a mid-upper arm circumference less than 13,5cm which is defined as severe malnutrition.

Of all the children under six years, 7 (1,4%) were both chronically and acutely malnourished, two of them were also severely malnourished.

- under weight for age - acutely malnourished
- chronically malnourished - severely malnourished

We see from this table that the % of underweight children in each age group has come down from 1980 till 1982. This is also the case for the % of acutely and severely malnourished children, but the opposite holds for the percentage of chronically malnourished children.

Road to Health Card.

We were able to see the Road to Health Cards of 427 out of 504 children. Of 44 children we were told that they didn't possess a Road to Health Card.

Vaccination Status for Measles

Of the 504 children that were seen:

- 415 possessed a vaccination card
- for 13 children the vaccination card was locked away
- 30 children's vaccination cards were lost
- for 3 children it was unknown whether they possessed a vaccination card or not.

Corrected for 7 children under 3 months of age the relative frequencies of these figures on 497 children are given in table V.4.

Of the 504 children, 11 had a measles attack and weren't vaccinated, 38 were younger than 6 months. So 455 children should have had at least one measles vaccination.

We found that 340 had measles vaccinations (74,7%) 69 didn't have any measles vaccination (15,2%), of 46 it was unknown whether they had had measles vaccination or not (10%).

World Vision Card (Passport to get free supplements)

Of all the children 13,1% possessed a World Vision Card that we were able to see. Of the children entitled to World Vision Cards, 0,4% had lost their cards. Of 0,8% it was unknown whether they possessed one and 85,7% of all the children didn't possess a World Vision Card. About half of the group of children possessing World Vision Cards still get supplements (6,3%).

During the third year the relative frequency of children having World Vision Cards and supplements is the highest (11,1%) and possession of a World Vision Card is most frequent in the sixth year.

Attendance Pattern

It was found that 85,5% of all the children went once or more to the UFC, 10,5% never went there and of 4,0% the attendance pattern is unknown. The mean relative frequency of attendance for each age group for all the children that came more than once is given in Table V.5.

One can conclude from Table V.5. that children who came more than once used more than three quarters of the possible attendances in the first year of life, and one

TABLE V.5. Mean Relative Frequency of Attendance for each Age Group for those Children that came more than once per year.

	0-11	12-23	24-35	36-47	48-59	60-71
Mean relative frequency of attendance.	78,3	55,8	54,2	30,8	27,5	25,0
Number of visits per year per child	9,4	6,7	6,5	3,7	3,3	3,0

quarter of the possible attendances in the sixth year of life.

Breast Feeding

Of all the children 91,5% were breastfed, 7,1% weren't breastfed for various reasons (illness of mother, pain in breast, child refused to drink) and of 1,4%, unknown. The mean period for breast feeding was $16,4 \pm 10$ months.

Advice

We asked all the mothers or caretakers if they could remember any advice given by the Feeding Team. If they said that advice had been given but without being able to give an example the answer to this question was regarded as negative. When they could give an example they were asked whether they followed it or not.

In this way it was found that, according to the person who came with the child, 58,1% couldn't remember or didn't know if any advice had been given, and 41,9% could give an example of advice given. Almost all mothers or caretakers of those who could give an example said that they had followed the advice (95%). Of the 41,9% of mothers or caretakers that could give an example, 86% said that they were advised on the diet of the child, 5% on visiting the hospital or clinic, 2% on hygiene and a few had had advice concerning treatment of diarrhoea at home and family planning.

DISCUSSION

As one can see in **Table V.2.** the number of deaths due to PEM in the paediatric wards dropped from 41% in 1980 to 15% in 1982. Through the years there has been a shift in the causes of death. In 1980, 22 out of 53 died due to PEM while in 1982, 6 out of 41 died from PEM (calculated for the analysed 6/12 period). From this changing pattern of death one can conclude that severe PEM is becoming less common in the hospital. This corresponds well with the findings of the nutritional status survey in 1982, compared with the figures of 1980. Acute malnutrition has significantly decreased to one/seventh, severe malnutrition almost halved. Although the child mortality in the second year is the most sensitive index for the public health (19), the child mortality for the first six years can also be seen as a reflection of the health condition.

The 0 to 6 year child mortality decreased from 9,5% in 1980 to 2,1% in 1982. This remarkable decrease during a two year period can only be achieved by improved curative and preventive services together⁴¹. The decrease of 8% represents 40 children in our sample who survived. These 40 children may explain partly the

increase of chronic malnutrition (17%) from 1980 to 1982.

In the nutrition rehabilitation ward, a very low mortality rate was found in 1982 (4%); Moosa reported that in 1978 a quarter of the severely malnourished children admitted in a hospital in Durban, died³⁹. Of the children admitted in the nutrition rehabilitation ward, 58% were malnourished and ill while 42% came for screening. In 92% of all the children infections were found which proves the statement that growth problems are related to infections⁹.

The sex distribution of the children admitted in the nutrition rehabilitation wards resembles both the sex distributions found in the sample of the cross sectional and in the follow-up study (45% boys, 55% girls). So one may not conclude that more girls than boys are malnourished. If one child in a family is on supplements, all the under six children have to be seen because we found that in 50% of the households with one child on supplements there is another malnourished child.

It was established that the bigger the number of children under six per household, the more likely it will be a household with children on supplements. With three or more children under six per household this chance becomes significantly higher.

In comparison with 1980, in 1982 no villages with significantly higher risk incidence of malnutrition were found though the Resettlements still tend to have the most severely malnourished children.

The intervention programme has caused an improvement in the vaccination status. Significantly more children than in 1980 have a vaccination card (1982 - 86%; 1980 - 68%) and those who have a vaccination card showed significantly more measles vaccinations. This status can be easily improved because it was found that 7,9% of children possessing a vaccination card didn't get any measles immunisations while they needed one or two according to their age:

There were also many children (52,8%) who didn't get the booster dose. According to recent literature¹⁸ the first vaccination will protect only 59% of children, therefore a second vaccination at 18 months is necessary to protect the further 40% of susceptibles. It is surprising that there are no children who died from measles in the hospital in 1981 - 1982, while there were 10 children during the period in 1979 - 1980. We

expected another peak in 1982⁴¹

The number of children attending the under five clinics has significantly increased compared with 1980. In 1980 only 27% of all the children attended the UFC, in 1982, 85,5%. The children who attend regularly (more than once) have a very satisfactory attendance pattern (82,9%)

In general, the utilisation of the UFC is satisfactory. This can't be said of utilisation of the services given by the clinic and the hospital for 52% of the children are born at home and 87% of the children died at home (figures from both cross-sectional and longitudinal study).

Perhaps more advice concerning the proper utilisation of hospital and clinic should be given. In the cross-sectional study of healthy children only 41,9% could give an example of advice given, while in the follow-up study children with PEM, 83,7% were able to remember the advice. This can be expected because healthy children who come for weighing and screening do not necessarily get advice. The majority (86%) of the advice record in the cross-sectional study concerned the diet. This was also the case in the follow-up study, (92,2%) advice on self-help was only 6,7% in the follow-up study, which also concerns the diet (chickens for eggs, meat, goats for milk). Therefore one can assume that the diet of these children has improved.

This is definitely the case for the children who got supplements. The diet is one of the factors which significantly correlate with acute malnutrition in the district⁵.

The other factors are:

- number of persons per household
- number of children under six per household
- age of the child
- attending school by caretaker yes/no
- attending school by mother (yes/no)
- diet
- possession of land (yes/no)
- possession of cattle (yes/no)
- building material of house
- frequency of attending UFC
- BCG scar present (immunisation status)
- source of water
- kind of village

Those factors that can be influenced in the short term by the Under Five Clinic are:

- frequency of attending under five clinic
- BCG scar - vaccination status
- diet

The first two factors definitely changed during the last two years. The diet can also have changed.

Those factors that can be influenced in the long term by the Under Five Clinic are:

- number of persons per household
- number of children under six per household
- possession of cattle
- source of water

The Intervention Programme is already trying to change these factors by family planning advice, advice about selfhelp (buying chicken) and hygiene. Also the water team of Gelukspan Community Hospital has

made a start to improve the quality and quantity of the water supply.


Those factors that can't be changed by the intervention programme are:

- age of the child
- attending school by caretaker (yes/no)
- attending school by mother (yes/no)
- possession of land (yes/no)
- building material of house
- kind of village

The age of the child hasn't changed in the last two years as the age distribution in our sample is the same as in 1980. Of the remaining factors we only can assume that they haven't changed much in such a short period.

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


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