

Nutrition Intervention in Venda – a proposed system of active case finding and food supplementation — E Zöllner



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Curriculum vitae

Ekkehard Zöllner obtained the MBChB at UCT in 1982. He worked in the Cape for a year and a half, when he was a medical officer with the SADF, mostly posted at Tshilidzini Hospital in Venda. In 1986 Ekkehard obtained the DCH (SA), in 1987 the DTM&H (Wits) and the DPH (Wits) in 1988. He stayed on in Venda for four years, working in Tshilidzini Hospital and teaching Primary Health Care Nurses in Paediatrics. Dr Zöllner is now a Paediatric Registrar at Groote Schuur Hospital.

Summary

The prevalence of Protein-Energy Malnutrition (PEM) and the inpatient morbidity/mortality associated with this disease in Venda, are presented. The need for a nutrition intervention is recognised and the health services evaluated with a view to such an intervention. An intersectorial intervention programme is proposed and two new priority services are discussed, ie, a system of active case finding for at-risk children, and a food supplementation scheme. A cost estimate is attempted.

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KEYWORDS:

Nutrition Surveys; Protein-Calorie Malnutrition; Food Supply; Developing Countries.

The prevalence of PEM in South Africa has been well described over the years. Little has been known about the nutritional status of under-fives (U5s) in Venda. This is not surprising, because Venda is presently a small state, of about half a million inhabitants, situated in the north-eastern corner of the Transvaal. Most Vendas live in rural villages. Their income is derived from migratory labour, and supplemented by subsistence farming.¹

In 1985/86 a nutrition survey (unpublished) of the Regional Health Organisation of Southern Africa (RHOSA) revealed that Venda had the highest proportion of underweight U5s of all the areas surveyed (16,4% compared to 8,4% in South Africa, which had the lowest). Within Venda, the

Tshilidzini health ward had the highest proportion of underweight U5s (22% in the Tshilidzini health ward compared to 12% in the Donald Fraser health ward, which had the lowest – see table I). In all health wards PEM was most prevalent in the 1-2 year age group.

Unfortunately no mortality data for the community is available to date. Hospital morbidity and mortality for PEM and PEM related diseases is shown in table II. Children admitted to Tshilidzini Hospital had higher mortality rates than children admitted to the other two hospitals with the same conditions. Although the data of the three hospitals is not truly comparable, much of this difference can be attributed to the lower nutritional status of children in that health ward.²

For the whole of Venda, the case fatality rate for severe PEM (kwashiorkor, marasmus, marasmic kwashiorkor) of 7,9% ranks third after malignancies (44,1%) and tuberculosis (9,2%). The corresponding prevalence rates are 168, 40 and 115 per 100 000 population (Department of Health, Venda; Health Status Report; 1988 – unpublished).

Clearly, the nutritional status of Venda's U5s is suboptimal and calls for a nutrition intervention. Whether such an intervention can be implemented effectively within present health service structures, needs to be ascertained.

Health Policy and Structure of Health Services in Venda

According to the National Development Policy, the objective of Venda's health service is "to improve

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Table I. Nutritional Status of Venda's U5s by Health Ward (RHOSA Survey 1985/86)

Indicator	Tshilidzini	Siloam	Donald Fraser	Venda
Low * weight for age (%)	22,0	15,0	12,0	16,7
Low * height for age (%)	40,2	46,6	28,9	33,6
Low * weight for height (%)	3,8	1,5	1,9	2,5

* low = less than 2 standard deviations below NCHS median

the state of physical, mental and social well-being of the people of Venda by means of a comprehensive well-balanced health service. To this end equal emphasis will be placed on preventive, curative, promotional and educational health services".³

Curative and preventive services are provided by the three hospitals (Tshilidzini, Donald Fraser, Siloam), two health centres, two maternity centres and fifty rural clinics.

PEM - Protein-Energy
Malnutrition

U5s - Under Fives

UWA - Under Weight for Age

FTT - Failure to Thrive

U5 clinics are organised weekly at all treatment points. Communities without fixed clinics are visited by a mobile "GOBI" team (growth monitoring, oral rehydration therapy, breast feeding and immunisation) every six weeks. The U5 clinics provide for growth monitoring, vitamin A supplementation, immunisation, oral rehydration for

diarrhoeal disease, food supplements, if needed, and education of mothers.

Care groups (a group of voluntary unpaid health workers active in the community) promote health at village level. Their key role in child health is to encourage mothers to bring their children for immunisation, as well as teaching them oral rehydration techniques.

Evaluation of the Health Services with a view to a Nutrition Intervention

1. Health Policy

Although not explicitly stated in the National Development Policy, it has been said that "the primary health care (PHC) approach is integrated into the health services".¹

This is commendable and certainly true as regards Venda's community services. As the promotion of proper nutrition forms an essential part of PHC,⁴ it should receive top priority in resource allocation. It would be good if this priority status of PHC could be included in Venda's health policy. This would facilitate priority resource allocation.

2. Under 5 Clinics:

The GOBI team in the Tshilidzini health ward was observed. The weighing of babies, plotting of weights, immunisations and the recording thereof were done well. Some inadequacies, however, still existed: no high care register, no system to trace defaulters by home visits, inadequate food supplements (both in quantity and quality), no submission of names of PEM

25% of severe PEM cases and 50% of mild PEM cases were not recognised in Venda OPDs

children by the hospital to the GOBI team and inadequate nutrition education (including education on breastfeeding). Work load seemed to be the main factor limiting one-to-one education.

The GOBI teams of the other two hospitals as well as U5 clinics at fixed treatment points are faced with similar problems.

3. Recognition of PEM at the Outpatient Departments (OPDs)

A study undertaken from April to June 1988⁵ revealed that approximately a quarter of severe PEM and approximately half of mild PEM cases were not recognised by health workers (doctors and PHC nurses). With regard to marasmus alone, approximately half the number of cases were not recognised. How efficiently PEM is diagnosed at other health care levels has not been established. Subjective evidence suggests that many PEM cases are missed.

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4. Immunisation

Together with improved nutrition and hygiene, immunisation is an important means of increasing resistance to infection.⁶ As regards immunisation, vaccination coverage and cold chain failure have been evaluated. The vaccination coverage is exemplary: 88% of the children surveyed were fully vaccinated and 91% were vaccinated against measles.¹ The cold chain evaluation⁷ showed that 78% of the vaccines evaluated were stored and transported below 10°C. If efficient vaccines can be assumed, then Venda's U5s receive excellent protection against the diseases they are vaccinated against.

Proposed Nutrition Intervention

Nutrition interventions performed in different parts of the world revealed encouraging results. After reviewing ten primary care projects Gwatkin et al concluded that "... effectively operated projects can reduce infant and child mortality rates by one-third to one-half or more within one to five years".⁸ Similar results were published by Bac from Gelukspan, Bophuthatswana. He also found that the prevalence and the inpatient case fatality rates for severe PEM were halved.^{9,10}

Based on these results the following objectives are considered to be feasible: the infant mortality rate (IMR), the case fatality rate for severe PEM and the proportion of low weight for age in U5s should all be reduced by a third after an intensive three-year nutrition intervention.

The intervention should run on three different levels concurrently (see figure 1):

Level I: data collection

Level II: intervention by the Department of Health;¹⁰⁻¹³

Level III: intervention by other state departments and agencies.^{14,15}

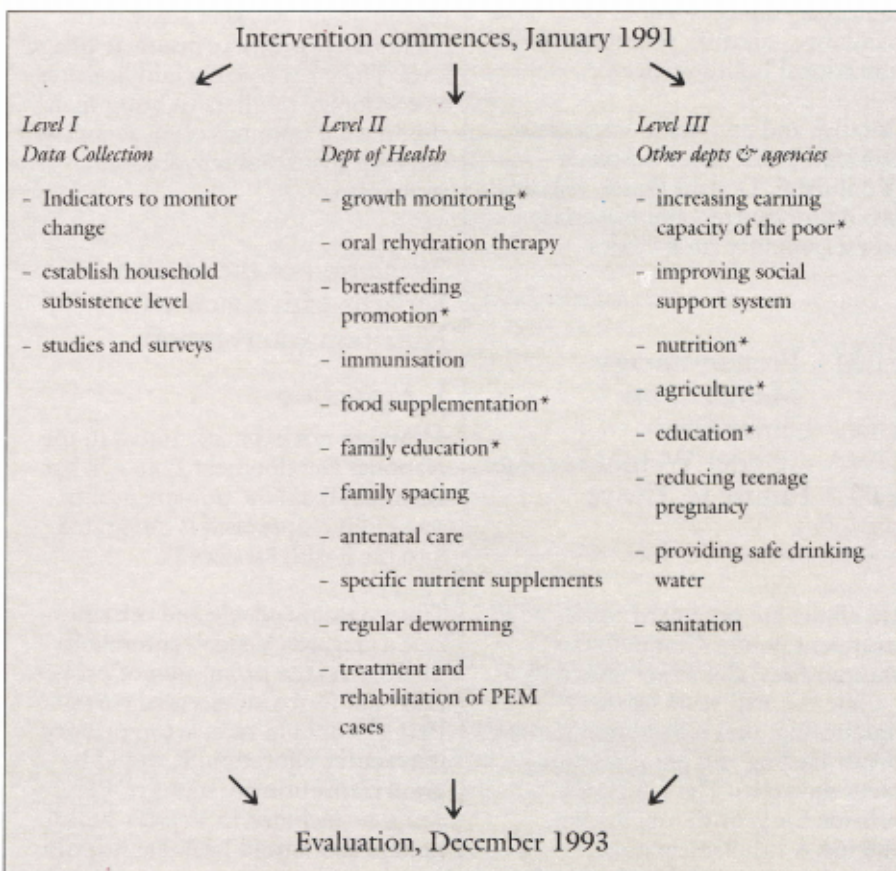
For the purpose of this article only level II will be discussed in some detail.

As stated above, PHC should receive top priority in resource allocation.

However, in a developing country such as Venda, resources are limited. Every component of the PHC approach therefore needs to be rated on a priority scale. As has been shown in China and Kerala, improvement of nutrition will have the greatest effect on the health of the people.⁶ Priority should therefore be given to services which are directly related to the improvement of nutritional status (indicated by an asterisk in figure 1).

Figure 1. Summary of Proposed Nutrition Intervention for Venda

Priority services related directly to improvement of nutritional status are indicated by an asterisk (*)



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Table II. Inpatient Morbidity and Mortality for Under-six Year Olds with PEM and PEM Related Diseases, Venda 1988.

Hospitalisation rates per 100 000 population.
Case fatality rates in brackets

Hospital *	Gastroent	Pneumonia **	Measles	Severe PEM ***
Tshilidzini	211 (8,9%)	255 (8,6%)	76 (8,2%)	196 (12%)
Siloam	335 (1,2%)	351 (1,9%)	74 (3,4%)	194 (6,5%)
Donald Fraser	171 (3,7%)	315 (3,2%)	137 (4,6%)	103 (5,3%)

* Donald Fraser figures for under-seven year olds, and measles figures for all ages;

** Pneumonia is defined differently in the 3 hospitals;

*** Severe PEM = kwashiorkor, marasmus, marasmic kwashiorkor.

Within the Department of Health this would be growth monitoring, food supplementation, breastfeeding promotion and family education. As shown in the evaluation, all of these need to be improved. Efforts concerning the latter two are currently being intensified. With regard to growth monitoring, even if this were done optimally, PEM would only be diagnosed in those U5s who attend U5 clinics regularly. The proportion of regular attenders is not known. A high vaccination coverage does not necessarily imply regular U5 clinic attendance. On the contrary, the subjective impression is

Nutrition interventions world-wide show encouraging results

that the majority of U5s do not attend regularly. As a result, many U5s with mild forms of PEM, viz underweight for age (UWA) and failure to thrive (FTT), will not be diagnosed. This finds its reflection in inpatient morbidity and mortality

(see table II). To prevent this, a system of *active case finding* is proposed.

Early diagnosis needs to be followed by appropriate action. Food supplementation forms an integral part of such action. The effectiveness of food supplementation has been proven in various parts of the world.^{8,9} As highlighted in the evaluation, food supplements in Venda have thus far been inadequate both in quantity and quality. No guidelines for their use have ever been laid down. An effective food supplementation programme, integrated in the overall nutrition intervention, still needs to be formulated.

Active Case Finding

The system of active case finding is based on the recognition of high risk factors known to influence a child's nutritional state.¹⁶ These are recorded, firstly, on the child's road-to-health chart under "reasons for special care" and, secondly, in a high care register. The register also contains other essential data

pertaining to the child, eg the weight. Different registers are kept at different points. The wards and the OPD forward a list of names, as well as all essential data to the respective hospital's community health matron. All at risk U5s are grouped according to the nearest treatment point. The re-arranged data is then forwarded to the relevant clinic, health centre or GOBI team.

The attendance of at risk children at treatment points is monitored. If a

Success depends on the motivation of every health worker

specific child fails to attend the U5 clinic twice in succession, a home visit by a separate *nutrition team* (still to be created) is to be conducted. The team will consist of two enrolled nurses. Their task will be to weigh the child, provide supplements (if necessary) and give health education to the caretaker. Regular attendance at treatment points will be encouraged.

Food Supplementation

For a food supplementation programme to be effective, clear guidelines need to be laid down. In determining type and quantity of supplements, the criteria of Bac and Glathaar¹² were followed. In addition to these, other criteria were considered (see table III). Correcting the protein deficit of PEM with food supplements is easy. Meeting an energy deficit is more difficult. As suggested by Bac, oil can be added to improve energy content (personal

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Table III: Food Supplements Considered

Supplement	Monthly		Daily			Abuse Potential	Cult Acceptability **
	Supply (kg)	Cost (R)	Kcal Supp & 3tsp oil	Protein (g)	Type*		
PVM	1	12,80	255	13,8	Animal	-	+
Caprovite	1	7,70	250	13,0	Plant	-	+
Full cream milk (Nespray)	1,5	9,12	385	13,0	Animal	++	+
Skimmed milk (Trimpak)	1,5	8,97	315	16,0	Animal	+	+
Lactogen	1,5	7,95	381	8,0	Animal	-	+
Lactogen high protein	1,5	7,95	367	10,8	Animal	-	?
Pea flour	2,5	5,10	385	17,0	Plant	?	-
Funa soup and barley	2,25	3,60	405	16,0	Plant	?	-

* Animal proteins are high quality proteins and are easily digested

** Emphasis is on acceptability rather than whether it is traditionally used

communication). It was decided that the mother should supply the oil herself. Apart from decreasing costs for the health services, it encourages the mother to be actively involved in the supplementation process.

Considering all criteria, skimmed milk is the best supplement. However, due to the lack of vitamins A and D (unless fortified), skimmed milk is not suitable before the age of one year.¹⁶ Locally, Lactogen has been used as a supplement for some time. Although the protein level in Lactogen is considerably lower than in skimmed milk, good results have been achieved with this product. The following guidelines were thus laid down:

Birth to 3 months:

Breastfeeding should be adequate. If

necessary (eg for triplets) a highly modified breastmilk substitute could be used.

Age 4 to 12 months:

50 gram Lactogen is added to the child's porridge daily.

Age 1 to 5 years:

50 gram skimmed milk is added to the child's porridge daily.

For the U5 older than 4 months, a teaspoon of cooking oil should be added to each meal.

U5s with all forms of PEM, all U5s who fail to thrive for three months and all triplets (twins only in exceptional cases) qualify for supplementation.

In every case, the mother must be interviewed to determine dietary habits, social circumstances, resources and recent/recurrent illness. Appropriate action must be taken. Mothers with a good income and no social problems do not qualify for supplements.

... reduced infant mortality by more than 33% within 1-5 years

Supplements are discontinued after three months' consistent weight gain, unless social circumstances or multiple births indicate a need to continue. Should there be no weight

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gain, should complications arise or a chronic disease be suspected, the child is referred to base hospital.

Cost estimate of new intervention programmes by the Department of Health

The running costs for existing services will not be reflected. The two new priority services will involve major expense.

Nutrition team

The initial cost is calculated to be R84 000. The annual running costs are expected to be R94 410 (which does not allow for salary increases, vehicle repairs etc).

Food supplementation programme

The estimated initial cost to supplement 85% of all existing UWAs for three months at 1989 prices is R165 510. The prevalence of FIT is not known and the cost of treating it can therefore not be calculated. New babies are born every year of which 11,8% can be expected to become underweight in their first year. To treat 85% of these will require an additional R47 062 annually.

Even if the above programmes are implemented effectively, the cost of treating and rehabilitating PEM cases will virtually remain unchanged. This is due to the high overhead costs involved in running these secondary and tertiary care projects. Only if wards and nutrition units would be closed, could these costs disappear.

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It has been decided to implement the proposed nutrition intervention with

slight modifications. Initially, the programme will run as a pilot project in the Tshilidzini health ward only. As regards level III interventions, little has, unfortunately, been achieved to date.

The success of this project will stand or fall with the motivation of everyone concerned, be it health worker, community members, health care manager or administrator. To this end health workers should be kept abreast of developments, and be encouraged to make positive contributions. Community support and involvement will have to be secured. Commitment at health management and administrative level will involve the appraisal of priorities and the possible re-allocation of funds. Only when full support is ensured, can we expect to alleviate suffering, ill-health and death from a disease that in itself is entirely preventable.

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Addendum

The protein content of Lactogen has recently been further reduced. Lactogen high protein (Lactogen 2) instead of Lactogen (Lactogen 1) is therefore recommended as a food supplement for the 4-12 month old children.