Diarrhoeal diseases in the Gelukspan Health Ward 1983-84

Paulo Ferrinho

Part one of a three-part article

Summary

This article is divided into 3 parts. In Part I a general introduction to the Health Services in the Gelukspan District is given with the reasons for such a survey. The data from children admitted with diarrhoeal diseases to our ward over a period of 7 months are analysed, with regard to seasonal, age, sexual and nutritional factors as well as mortality. Then the 70 questionnaires completed with the caretakers of the above children are discussed and analysed.

Part II represents the results of a community survey on Diarrhoeal Diseases conducted in 1984, including the attitudes and knowledge of the caretakers concerning this disease and aspects of domestic hygiene.

In Part III the findings are discussed in relation to other surveys in trying to understand what is happening regarding Diarrhoeal Diseases in the Gelukspan area. Some conclusions and recommendations are made.

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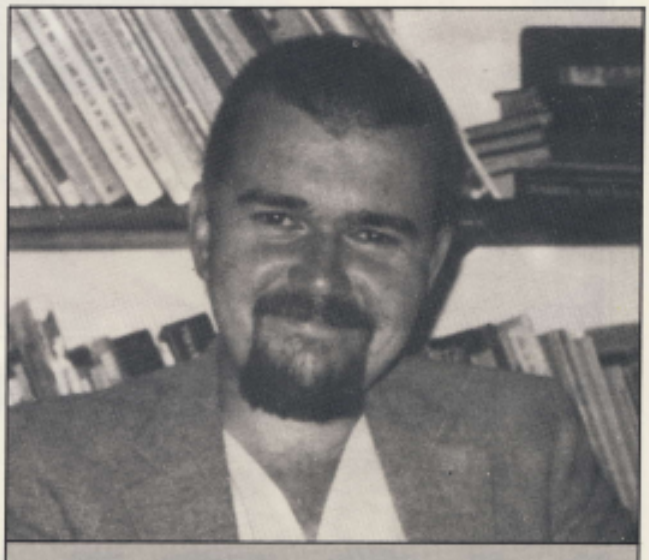


Curriculum Vitae

Paulo Ferrinho was born in Mozambique and went to school in Maputo. He studied at UCT where he obtained the MB ChB in 1980. He did his internship at Groote Schuur Hospital in 1981 and has been at Gelukspan Hospital since 1982. Dr Ferrinho's basic interest lies in Primary Health Care with the emphasis on psychiatric and maternal and child health care.

KEYWORDS: Malnutrition; Diarrhea, Infantile; Developing Countries; Health Education; Delivery of Health Care; Dehydration; Fluid Therapy.

ABBREVIATIONS

ANC — Ante-Natal Clinics
BF — Breast feeding
DD — Diarrhoeal Diseases
FP — Family Planning
HDD — Household where at least one of the underfive children has had diarrhoea over the study period.
NDD — Households where none of the underfive children had diarrhoea over the study period.
ORS — Oral rehydration solution
PNC — Postnatal Clinic
SSS — Salt-Sugar Solution
UFC — Underfive children

Diarrhoeal diseases in the Gelukspan Health Ward

INTRODUCTION

HEALTH SERVICES IN THE GELUKSPAN DISTRICT

The Gelukspan Community Hospital serves a population of 72 458 people (calculated, 1983), most of Tswana origin, living either in long-established traditional villages or in more recently established resettlements as a result of the political policy in Southern Africa.

Agriculture and cattle farming are the main occupations of the population; migrant labour is the major source of income; the hospital is the main employer in the region.

The health status of the population has been extensively studied in community surveys[1,2,3,4,5], carried out by Dutch students under the guidance of Dr M Bac. It was in response to the finding of these surveys that our system of health care has evolved with general emphasis on primary health care and particular emphasis on childhood malnutrition. The description and the successes of this intervention program have been published[6].

We have one hospital, seven clinics (fixed points), 8 mobile clinic points, a mobile underfive team, a psychiatric community team, a TB team, an Eye team, a school nurse, social workers, an environmental health team and a dental team involved in community work. Every one is supposed to provide preventive services and, with the exception of the school nurse and the social workers, to provide curative services also.

Both the hospital out-patients department and all the clinics have special clinic days for ANC, FP, UFC, PNC, Psychiatry and TB cases. We try where possible to combine PNC/UFC/FP in a single visit to the clinic. The mobile clinic tries to attend to the villages where there is no fixed clinic and its points are selected so that the whole population has access to our health workers within a distance of 15 kilometres at least once a month. The mobile underfive team reaches 90% of the pre-school children in the district and promotes health education, immunizations, simple curative services and at the same time screens them for malnutrition, putting these children that are at risk on food supplements, and admitting the ones with severe malnutrition.

In the hospital we have 70 maternity beds, 270 TB beds and 225 general beds (of the general beds 3/5 are paediatric beds), one general paediatric ward, one nutrition rehabilitation ward, a paediatric ward for infectious diseases where all children with diarrhoea are admitted. We still have an extra 440 beds shared between an Old Age Home and an Institution for the Crippled. There are seven doctors and about 180 nurses in the hospital and 25 nurses in the district clinics. This means about 1 doctor per 11 500 people and 1 nurse per 250 people[4].

THE DIARRHOEA PROJECT

In all the surveys already mentioned and in our annual reports on the district, malnutrition and diarrhoeal diseases alternate year after year as the major causes of death in pre-school children according to hospital statistics.

This fact, together with the fact that we already had a successful nutrition program initiated by Dr M Bac, brought out the need to complement the nutrition project with a special intervention directed at diarrhoeal diseases. The first steps were taken when in 1981 a survey was conducted on water and diarrhoeal diseases; health education by all our teams always emphasized the need for oral rehydration. But it was not until last year that the diarrhoeal project became a project on its own. The first steps were directed at improving in-patient care and developing teaching materials (songs: Appendix 1, and teaching posters) addressing this particular problem. The second step was the assessment of the knowledge of our clinic staff concerning the management of diarrhoeal diseases and the subsequent development of a flow chart for the management of DD. The third step was to study the characteristics of children with DD admitted to the ward, to find out what caretakers had done for children before admission and to do a community based study of DD. The results of these studies are presented and discussed in this three-part article.

Children admitted with diarrhoeal diseases between 1st October 1983 and 1st May 1984

SEASONAL DISTRIBUTION AND STUDY GROUP

As seen from Graph 1.1, diarrhoeal diseases tend to occur over the hot, rainy season and that is the reason why 306 (44,15%) of all the 693 children admitted to our infectious disease ward during the study period had DD; of these only 217 originated from our health ward and it is the data from this group that we will analyse.

AGE DISTRIBUTION

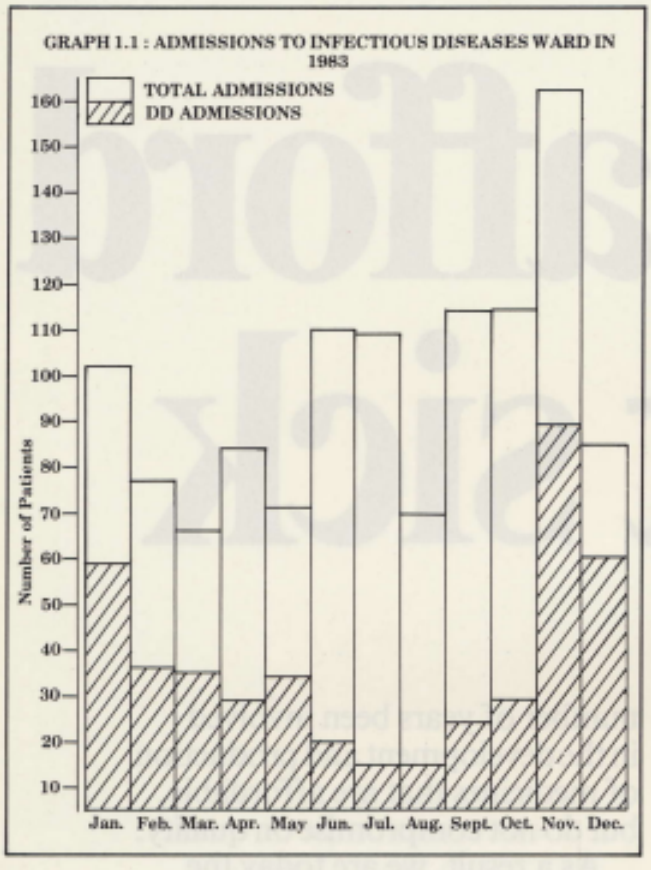
The majority (59%) of the children admitted with DD are in the first year of life and 86% in the first 24 months of life. In 4 cases the children were over five years and in 15 cases the precise age was unknown. The highest incidence was between the ages of 5 and 10 months (Graph 1.2).

SEX DISTRIBUTION

There was a predominance of 121 males over 96 females, although in the district, in the same age group, there is a slight female predominance[4].

CARETAKERS ADMITTED WITH THE CHILDREN

We encourage caretakers, preferably the mother or the



one in charge of the child on a day to day basis, to come to our wards with the children. The advantages are that breast-feeding is not interrupted, it relieves our overworked nurses and gives us a unique teaching opportunity.

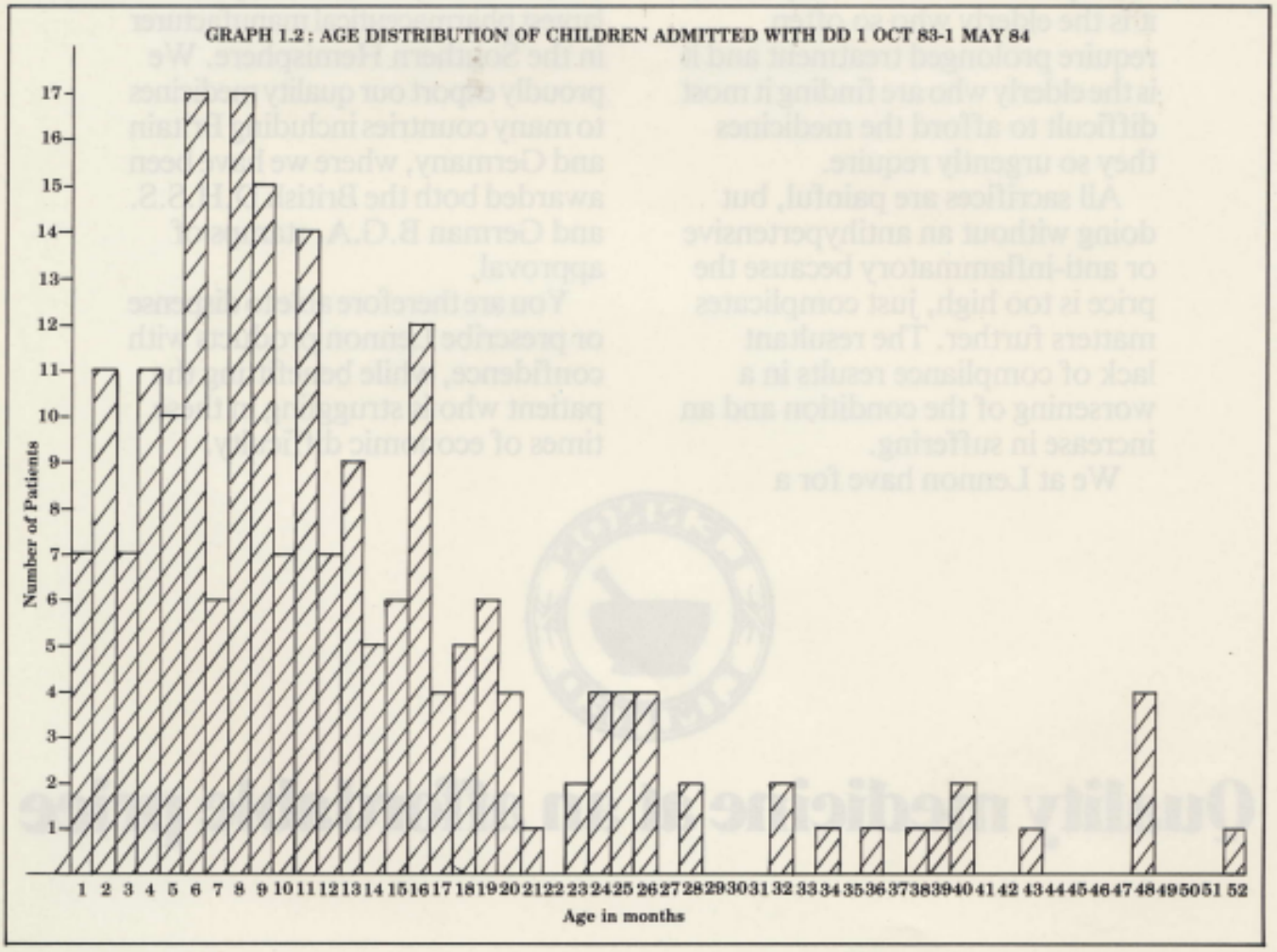
In 80,7% of the cases a caretaker was admitted with the child.

NUTRITIONAL STATUS

One hundred and twenty three children (56,7%) were underweight*. Of these 39 (18%) had severe malnutrition**. In graph 1.3 we compare the average weight of our district children (data provided by Gimbel and Ruiter[5]) with that of children admitted with DD. At all ages our children with DD are underweight in relation to the average district child in May 1984 (levels of significance not calculated because of the small numbers involved).

USE OF AN ORAL REHYDRATION SALT-SUGAR SOLUTION (ORS) BEFORE ADMISSION

We promote the use of an oral rehydration solution consisting of 1 litre of boiled water to which one level teaspoon of salt and 8 teaspoons of sugar are added. Thirty seven (21,1%) of all the caretakers claimed to have used it before admission. In Table 1.1 we try to compare the electrolyte and fluid imbalances of children that received ORS before admission and those that did not.



GRAPH 1.3

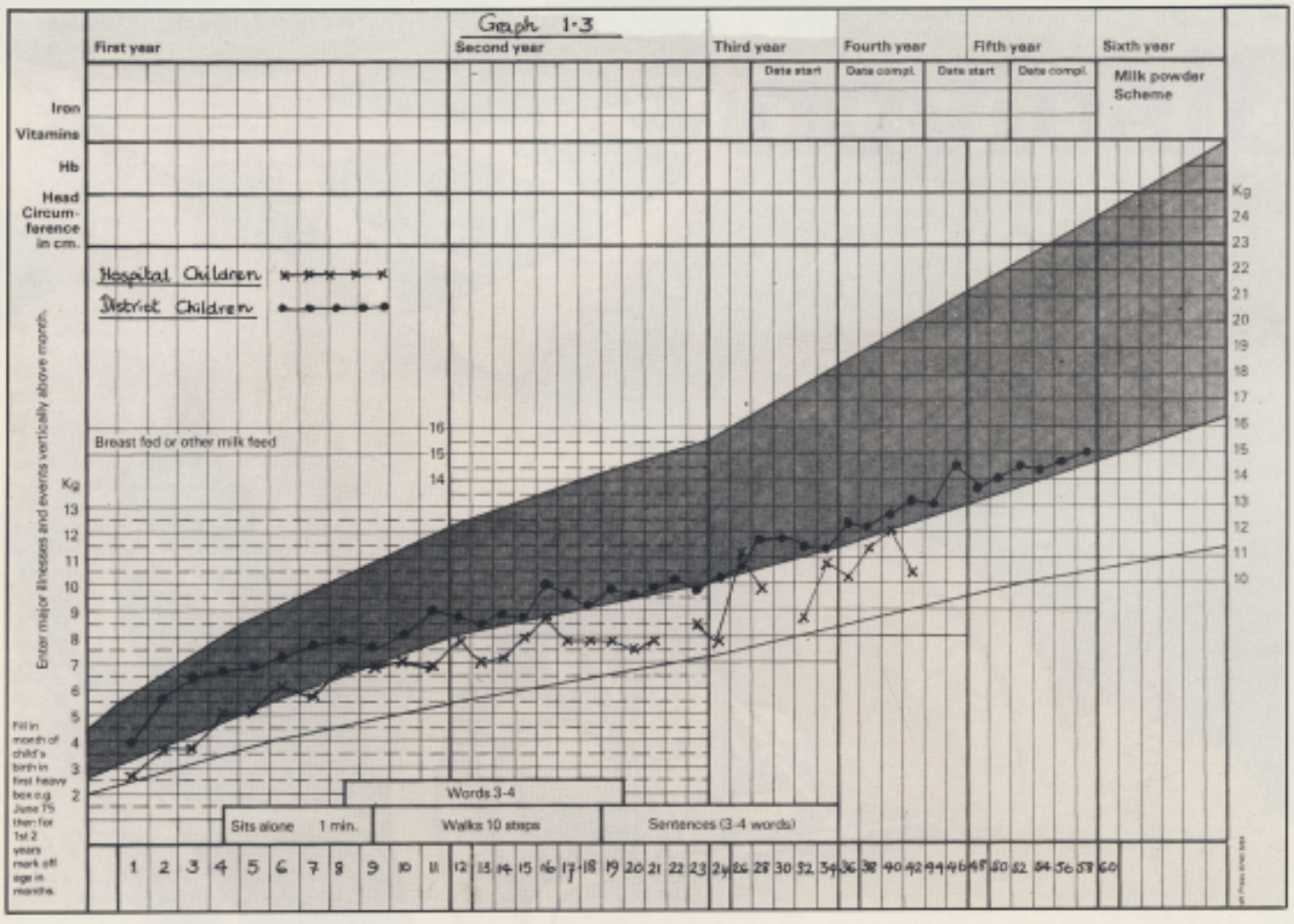


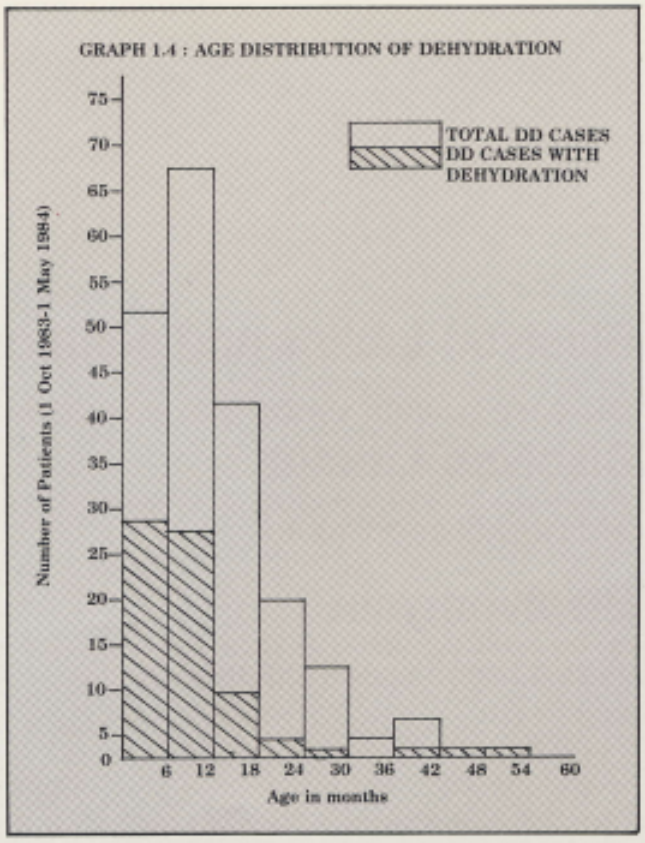
TABLE 1.1
FLUID ELECTROLYTE IMBALANCES

mmol/l	ORS used - 37	ORS not used - 69	Total 206	
Na < 130	10 (27,0)	20 (11,8%)	30 (14,60%)	sig at 5% level
K < 3,5	15 (40,5%)	36 (21,3%)	51 (24,8%)	sig at 5% level
U > 7	5 (13,5%)	15 (8,4%)	20 (9,7%)	not significant
Dehydration ***	12 (32,4%)	55 (32,5%)	67 (32,5%)	

* ***Underweight means weight for age less than 80%*** *for the mean Harvard standard*

** *A child was considered severely malnourished if she had either marasmus or kwashiorkor (Wellcome classification) or an arm circumference of less than 13cm.*

*** *Dehydration means clinical dehydration as assessed by the admitting doctor.*



We see from Table 1.1 that electrolyte imbalances are more common in patients that used a salt-sugar solution at home. The incidence of dehydration is equally common in both groups; dehydration is the indication for admission only in one third of all cases. From Graph 1.4 it can be seen that dehydration is most common before the age of one year.

MORTALITY

Parenteral infections are a common concomittant finding in children admitted with DD. Of all the DD

cases, 11 (5,1%) were notified as having tuberculosis. As we can see in Table 1.2, in 4 out of every 9 deaths one of the contributing factors was a parenteral infection with involvement of the lower respiratory tract. In cases 1, 3, 4, 6 post mortems were refused, but it is our experience over the past years that bronchopneumonia is the commonest finding on post mortem examinations of children that died with diarrhoeal disease.

The mortality due to DD in our hospital has been reduced over the years from 12,2% in 1982, to 6,7% in 1983 and now 5,1% in the study period*. But we still see that mortality occurs in children with the sinister combination of ***Malnutriton — Dehydration — Hypokalaemia — Systemic Infection,*** admitted in extremes and dying a few hours after admission.

TABLE 1.2
MORTALITY

CASE	AGE	SEX	MALNUTRITION**	ORS	HYDRATION	U+E	ASSOCIATED PATHOLOGY	TIME OF DEATH***
1	6/12	F	Marasmus	No	10%	K=2,8	Unexpected respiratory arrest with bleeding from trachea	< 24 hrs
2	7/12	F	Underweight	No	10%	U=11,6 K=3,1	RUL Pneumonia	< 24 hrs
3	9/12	M	?	Yes	10%	K=1,8	Liver failure. Witch doctor medicines	< 24 hrs
4	11/12	F	Kwashiorkor	No	Good	K=2,4	-	7 days
5	13/12	M	Underweight	No	10%	K=1,4	Bronchopneumonia	< 24 hrs
6	14/12	F	Marasmus	N0	Good	K=2,6	-	< 24 hrs
7	20/12	M	Kwashiorkor	No	Good	K=2,7	Liver failure	< 24 hrs
8	? 4 yrs	M	Underweight	No	5%	U=7,1	Bronchopneumonia necrotizing enterocolitis, submassive liver cell necrosis	< 24 hrs
9	< 5 yrs	F	Underweight	No	?	-	Disseminated tuberculosis	< 24 hrs

* *The mortality rates for 1982 were calculated for all DD cases independently of the place of origin ie whether they are from our district or from outside.*
** *Wellcome classification.*
*** *As from admission.*

RESULTS OF A QUESTIONNAIRE TO 70 CARETAKERS OF CHILDREN WITH DIARRHOEAL DISEASES ADMITTED TO OUR INFECTIOUS DISEASES WARD

STUDY METHODS:
From 1 October the first seventy caretakers admitted with children with DD were questioned by means of a written questionnaire (Appendix II) aimed at finding out:

1. Duration and features of the disease before admission.
2. Home care of diarrhoeal diseases;
3. Type of medical help sought;
4. Nutritional manipulation in cases of diarrhoeal diseases.

FEATURES OF DIARRHOEAL DISEASE BEFORE ADMISSION
The features of diarrhoeal cases before admission are summarized in Tables 2.1, 2.2, and 2.3.

TABLE 2.1
DURATION OF DIARRHOEA ON ADMISSION

Day	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	10-21	21
No	10	14	16	8	12	2	5	0	0	1	1	1

Average duration: 4-4,5 days.

TABLE 2.2
HISTORY OF PREVIOUS DIARRHOEAL EPISODES

YES	31 (44,3%)
NO	32 (44,3%)
NOT KNOWN	7 (12,4%)

TABLE 2.3
ASSOCIATED VOMITING

YES	39 (55,7%)
NO	31 (44,3%)

In 18 of the households (25,7%) there was a history of previous diarrhoea in other siblings.

TYPE OF HEALTH CARE PROCURED BEFORE ADMISSION
About 1/5 (21,4%) of all caretakers took their children to a general practitioner before bringing them to the hospital. In 14,3% they attended a traditional practitioner. In none of the cases did any of the health practitioners advise ORS.

WATER SUPPLIES AND WATER HYGIENE

About 81,5% of all cases have access to potentially clean water (Table 2.4).[2].

TABLE 2.4
WATER SUPPLIES

River	4 (5,7%)
Roadside Pool	2 (2,8%)
Borehole	57 (81,5%)[2]
Well	7 (10,0≥)

The number of caretakers is equally divided between those that regularly treat water by boiling before consumption (34) and those that do not do it (34; in 2 cases not known).

DIET AND DIETARY MANIPULATIONS

These results are summarized in Tables 2.5 and 2.6.

TABLE 2.5
BREAST-FED CHILDREN

Pattern	Number	Percentage
Exclusive	5	7,1%
Together with mixed diet	32	45,7%
TOTAL	37	52,8%

TABLE 2.6
BREAST-FEEDING ACCORDING TO AGE GROUPS

Age (months)	Yes	%	No	%
0-6	17	= 65,4	9	= 34,6
7-12	12	= 70,6	5	= 29,4
13-18	4	= 50,0	4	= 50,0
19-24	0	= 0	3	= 100
24-5 yrs	0	= 0	9	= 100

The younger age groups are slightly overpresented in Table 2.6 but it is natural to expect that the younger the child the more likely the baby will be admitted with the caretaker. Breast-feeding decreases with age and after 18 months none of the children were breast-fed. Only 5 (19,2%) of the twenty six children under the age of 6 months were exclusively breast-fed.

We tried to assess to what extent caretakers modified the diet of children under their care with the onset of diarrhoea. This happened in 55,7% of all cases; in 4 cases (5,7%) total starvation was practised and in 11 cases (15,7%) only clear fluids were given.

HOME REMEDIES FOR DIARRHOEA

Home remedy is defined here as any form of therapy accepted and mentioned as such by the caretaker.

The great majority of our caretakers (84,3%) mentioned the use of some sort of home remedy. Of the 59 that mentioned the use of home remedies, 23 (32,9% of the total) used some accepted form of oral rehydration; 26 used clear fluids (eg black tea, rooibos tea, boiled water with sugar, plain boiled water). We are then left with 22 (31,4%) caretakers that dispensed a more complex form of therapy to the children under their care (an average of 1,45 medications per child) (Table 2.7).

TABLE 2.7
CARETAKER MEDICATIONS FOR DIARRHOEAL DISEASES

Groenamara	5	Castol Oil	3
Enterens Druppel	3	Stappe Druppel	1
Haarlemensis	3	Dupa	1
Milk of Magnesia	4	Tlhokalatsela	1
Gripe Water	4	Muthi we Nyoni	1
Rooilaffental	1	Sunlight soap enema	2

Part II will give the results of a community survey.

APPENDIX II

QUESTIONNAIRE TO CARETAKERS
DIARRHOEA IN GB 7

Name: ..... Date of Admission: ..... No: .....
Age and months: ..... Clinic Attendance: .....
Diarrhoea — X ..... Days/X ..... Today
— 1st time
— Relapsing
Vomitting — X ..... Days/X ..... Today
Home treatment of diarrhoea (Home medicine) .....
Traditional doctor therapy .....
Western doctor therapy .....
Diet — Before diarrhoea — Breast .....
— Other (specify) .....
— After onset of diarrhoea .....
Is water boiled before use:-
Never .....
Sometimes ..... Specify when .....
Always .....
Water supply from:
— River, — Roadside pools, — Handpump, — Well, — Borehole, — Other
Mother — F.P. ..... Specify .....
— Age .....
— G .....
— How many died .....
— How many died due to diarrhoea .....
— How many had diarrhoea .....
Guardian other than mother .....

APPENDIX 1

SIGNS OF DEHYDRATION

When the child is dehydrated
The skin becomes dry
When the skin is pinched
Inelasticity is present

When the child is dehydrated
The fontanel is depressed
He is irritable
He is no more active

When the child is dehydrated
He keeps on crying, but no tears
Eyes are sunken
He tends to close eyes

When the child is dehydrated
The mouth becomes dry
No saliva at all
The child becomes thirsty

When the child is dehydrated
The urine is concentrated
It comes out in drops
Or no urine at all

When the child is dehydrated
The heart beat is rapid
Respiration is fast
And the child is feverish.

DIARRHOEAL SONG

Be aware, be aware mother
The baby is having diarrhoea
Fluids are lost
The baby is dehydrated

Be aware, be aware mother
Fluids shoud be replaced
Together with their mineral salts
Do not panic mother

Boil a litre of water
Eight teaspoons of sugar
One teaspoon of salt
Give after each bowel action

The baby is no more having diarrhoea
Solution has been prepared
Darrows solution

DITSHUPO TSA GO MUNEGA

Fa ngwana a munegile
Letlalo le a omelela
Letlalo le ema ntlha
Fa mma o le tlhoba

Fa nowana a munegile
Phogwana yona e a wela
Ngwana o tenega fela
Ga a batle go tshameka

Fa ngwana a munegile
Selelo se tlhoka keledi
Matlho one a wela
O rata go a tswala

Fa ngwana a munegile
Molomo o a phaphalela
Mathe ganong a kgala
Mme ngwana o a nyorwa

Fa ngwana a munegile
Motlhapo o na o borokwa
O tswa o le thoti
Kapa oa nyelela

Fa ngwana a munegile
Pelwana e betsa ka pele
Khemo yona e bonako
Mme ngwana o gotetse.

METSI A MOTSHOLOLO

Bona bona bona mma
Ngwana o a tsholola
Metsi a latlhega
Ngwana o a munega

Bona bona bona mma
Metsi a busetswa
Le matswai a ona
O se tshoge tlhe mma

A litara e bele
Sukiri ga robedi
Letswai gangwe fela
Nosa ga a tsholola

Ngwana g a sa tsholola
Metsi a dirilwe
Metsi a motshololo

REFERENCES

1. Van der Knaap M, Bekkers M. A Nutrition survey in Bophuthatswana. Rotterdam, Holland: Erasmus University, Dpt of Epidemiology, 1982.
2. Van As AB, Kasbergen J. Waterresearch report of the Ditsobotla district — Bophuthatswana. Rotterdam, Holland: Erasmus University, Dpt of Epidemiology, 1981.
3. Oosthoek CHA, Van Hooft IMS. A Nutrition survey in Gelukspan Health district — Bophuthatswana. Rotterdam, Holland: Erasmus University, Dpt of Epidemiology, 1982.
4. Graal MB, Schmeets IOL. Measuring health in the Gelukspan district — Bophuthatswana. Rotterdam, Holland: Erasmus University, Dpt of Epidemiology, 1983.
5. Gimbel HL, De Ruiter IPC. GOBI and pre-school child health survey in Bophuthatswana. Rotterdam, Holland: Erasmus University, Dpt of Epidemiology, 1984.
6. Bac M. Measuring and managing protein-energy malnutrition in rural communities. *S Afr Fam Prac.* Booklet Series No 1, Pretoria, 1984.