

# Diarrhoeal diseases in the Gelukspan Health Ward 1983-84

Paulo Ferrinho

Part two of a three-part article.

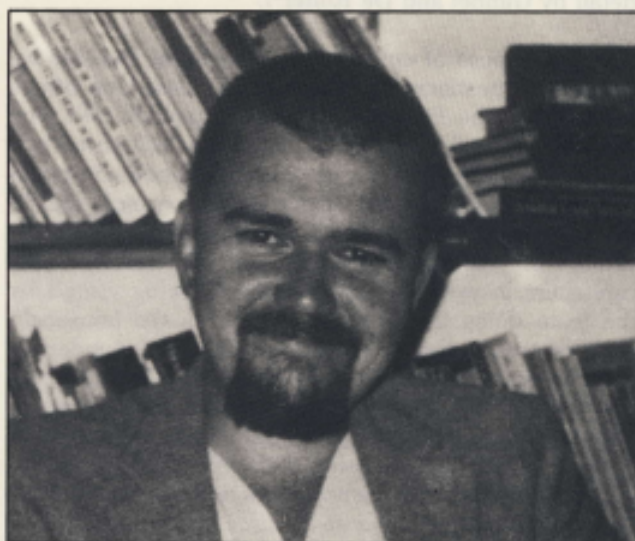
## Summary

*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:** Dairrhea, 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



# Results of a community-based survey of diarrhoeal diseases amongst preschool children

## STUDY METHODS AND OBJECTIVES

During May 1984 a nutrition survey was conducted for the Gelukspan district, as well as for selected areas of the districts served by Bophelong Community Hospital and Thusong Community Hospital<sup>5</sup>. For this purpose a random sample of underfive children from our district was selected and a sample of children from villages comparable to the ones in our sample was taken from the other two districts (the method is described in more detail by Gimbel and De Ruiter<sup>6</sup>).

For the purpose of our study on diarrhoeal diseases we devised a questionnaire (Appendix 4) based on others available in the literature<sup>8,9,10</sup>, and expanded. We pre-tested it in a pilot study conducted amongst caretakers of children admitted in the hospital, modified it and then we applied it to the above random sample and to the sample in the other two districts. Because of the extent of the questionnaire we interviewed only caretakers in every second household being visited by the team doing the nutrition survey. In the household we tried to interview the mother of any of the underfive children or, in her absence, the caretaker involved in the daily care of the child. The interviews in the pilot study and during the actual studies were always conducted in Tswana by the same nursing assistant. Caretakers were only interviewed in households where there was at least one living underfive child at the time of the survey.

The aims were to determine:

1. The incidence of diarrhoeal diseases in the underfive children of our district;
2. The diarrhoeal mortality rate in the same age group;
3. Knowledge and attitudes of caretakers concerning the definition, cause, management and rôle of the health services where diarrhoeal diseases are concerned;
4. The extent to which a simple sugar-salt solution is already known in our district and what the possibilities of expanding it further are.

All the data obtained from our district was analysed by the author himself. For the other districts we only analysed points 1, 2 and 5. Four hundred and two (402) households were visited in our district and 399 in the other two districts combined.

## RESULTS FOR THE GELUKSPAN DISTRICT

### CARETAKERS AND THEIR CHARACTERISTICS

Seventy five percent (75%) of all the children were looked after by their own mothers and there was no significant difference between HDD and NDD (72% and 77% respectively).

TABLE 3.1 CARETAKERS

	HDD	NDD	TOTAL
Mother	108 (72,0%)	194 (77,3%)	302 (75,3%)
Grandmother	28 (18,7%)	36 (14,3%)	64 (15,9%)
Other	14 ( 9,3%)	21 ( 8,4%)	35 ( 8,7%)
TOTAL	150	251	402

TABLE 3.2  
SCHOOL LEVEL OF THE CARETAKERS  
(ALSO APPENDIX V)

	HDD	NDD
Number	143	241
Average (yrs) Schooling	4,5	4,6
SD (yrs)	3,7	3,4
% That never went to school	30,1%	23,2%

TABLE 3.3  
NUMBER OF MOTHERS THAT BREAST-FED  
THEIR BABIES (ALL AGE GROUPS)

	HDD	NDD	TOTAL
Yes	59 (54,6%)	118 (60,8%)	177 (58,6%)
No	42 (38,9%)	70 (36,1%)	112 (37,1%)
Don't know	7 ( 6,5%)	6 ( 3,1%)	13 ( 4,3%)
TOTAL	108 (100%)	194 (100%)	302 (100%)

None of the differences in any of the above tables is statistically significant. The numbers in Table 3.3 must be interpreted carefully as we are not clear what they represent. Is it the mothers that are still breast-feeding at the time of the interview? Is it the number of mothers that breast-fed at any stage?

### INCIDENCE OF DIARRHOEA

In Table 3.4 we can see that 25,8% of all underfive children in our sample, accounting for 37,6% of all households, had at least one episode of diarrhoea over the past year. In households with one child there seems to be a lower incidence of diarrhoea than in households with two children or more (Table 3.5). This can also be seen in Table 3.6; households with diarrhoeal diseases have a higher average number of children per household than households where diarrhoea does not occur.



## Diarrhoeal diseases in the Gelukspan Health Ward

**TABLE 3.4**  
**INCIDENCE OF DIARRHOEA**

	NUMBER	%
Total: underfive children	656	100%
Underfive children $\bar{c}$ diarrhoea	169	25,8%
Total number of households	402	100%
Households with DD	151	37,6%

**TABLE 3.5**  
**INCIDENCE OF DD vs NUMBER OF CHILDREN PER HOUSEHOLD**

NUMBER OF HOUSEHOLDS WITH N CHILDREN				NO OF CHILDREN WITH DD	CHILDREN $\bar{c}$ DD PER HDD
N	TOTAL SAMPLE	WITH DD	%		
1	220	67	30,4%	67	1
2	127	59	46,5%	69	1,2
3	36	17	47,2%	26	1,5
4	12	5	41,7%	6	1,2
5	1	1	100,0%	1	1,0
6	1	0	0%	0	0

**TABLE 3.6**  
**AVERAGE NUMBER OF CHILDREN PER HOUSEHOLD**

	NUMBER OF HOUSEHOLDS	NUMBER OF CHILDREN	$\bar{X} \pm SD$
Total sample	402	656	1,6
HDD	151	267	1,8 $\pm$ 0,8*
NDD	251	389	1,5 $\pm$ 0,8*

\* SED = 0,06%  
MX-MY = 0,3  
Significant at 1% level

### MORTALITY OF DIARRHOEA

Unfortunately, because of careless collection of data we were unable to use data from our study that would allow us to calculate the mortality due to diarrhoeal disease. We are therefore grateful to Gimbel and de Ruiters<sup>5</sup> for permission to use data from their survey for this purpose.

Out of a sample of 910 underfive children, 17 died (underfive mortality of 1,87%) and of these, 7 deaths (41,2%) were due to diarrhoeal disease. Assuming an incidence of 25,8%, we can calculate that the number of children with DD in their sample was 235, giving us a case mortality rate for DD of 3,0%

All the children that died with DD were < 12 months of age.

### KNOWLEDGE AND ATTITUDES OF CARE-TAKERS CONCERNING DD

#### *The definition of diarrhoea*

In this survey the functional definition of diarrhoea was the caretakers' definitions. The replies to the question "How do you know when your child has diarrhoea?" therefore came as a surprise. The results can be seen in Table 3.7 and it is striking that over one third of the caretakers in the sample did not know the reply to the above question and there was no significant difference between the answers of caretakers of children that had had DD and of children that did not have it over the past years; (39,0% and 37,5% respectively, replied "I don't know" to the above question). Was this due to inability to verbalize knowledge? Was there an impulse to please the interviewer by admitting to the occurrence of diarrhoeal diseases when that was not true? Was the present caretaker absent on seasonal work during the period when her child was having diarrhoea?

Another interesting aspect is that 9,0% of the caretakers defined diarrhoea by a feature other than the character of the stools; it might be that this was the aspect considered worrisome and pathological rather than the watery stools themselves.

**TABLE 3.7**  
**CARETAKERS' DEFINITION OF DIARRHOEA**

	HDD	NDD
Total Number	146	232
Did not reply	5	19
Replied "I don't know"	57 (39,0%)	87 (37,5%)
OTHER REPLIES	COMBINED SAMPLE	
Loose or watery stools	198 (52,4%)	
Green stools	1	
Losing weight	6 (1,6%)	
Refusing feeds	12 (3,2%)	
Weak	10 (2,7%)	
Pyraexia	1	
Vomitting	2 (0,5%)	
Coughing	1	
Sunken eyes	3 (0,8%)	

*Interviews were always conducted in Tswana and by the same nursing assistant.*

The fact that the replies were the same in the two groups of caretakers under discussion might be due to the fact that although there were no episodes of DD in the children under the care of certain caretakers over the past years, this might have happened in the years before.



## Diarrhoeal diseases in the Gelukspan Health Ward

### The causes of diarrhoea

A summary of the findings are given in Table 3.8: there were no significant differences between HDD and NDD.

REPLIES	NUMBER	%
Don't know	312	83,9%
Lack of hygiene	40	10,7%
Teething	11	3,0%
Not eating good foods	6	1,6%
Warm milk	1	0,8%
Stomach ache	1	
Disease	1	
TOTAL	372	100%

It was very disheartening to find out that over 80% of our caretakers don't know the cause of DD.

### How seriously are diarrhoeal diseases perceived?

#### Is diarrhoea a disease?

Seventy six percent (76%) of all caretakers said that DD was a disease. Twenty four percent (24%) said that they did not know. No one said that DD was normal. There was no difference between HDD and NDD.

#### Can a child die from diarrhoea?

More mothers of children that had had DD over the past year thought that a child could die from the disease (74,5% for HDD vs 59,0% for NDD:  $p < 0,001$ ).

#### Can the child become dry as a complication of DD?

Most caretakers did not recognize dehydration as a complication of diarrhoea. Only 44% of the caretakers belonging to HDD vs 36%\* for caretakers belonging to NDD recognized such a relationship. Forty four percent (44%) in the first group vs 53% in the second group replied that they did not know. The remaining replied "no" to the question.

\*Not significant.

Of interest is the fact that of 152 respondents who recognized dehydration as a complication of DD, 120 (78,9%) replied that a child could die as a complication of DD (vs 50,6% for those that replied "no" or "I don't know" to the above question)\*. Only four caretakers out of 395 respondents recognized at least two signs and symptoms of dehydration.

### Attitudes concerning the management of diarrhoeal diseases

#### Should liquids be given to children with diarrhoea?

Most of our caretakers do believe that children must be given oral fluids during diarrhoeal episodes (Table 3.9).

**Many of the children had at least one episode of diarrhoea over the past year.**

TABLE 3.9  
ATTITUDE TO GIVING FLUIDS TO CHILDREN WITH DD

	YES		NO		DON'T KNOW	
	Number	%	Number	%	Number	%
HDD	137	91,3% (1)	8	5,3%	5	3,4%
NDD	208	83,9% (1)	30	12,1%	10	4,0%

(1) SED = 3,5

$p_1-p_2 = 7,4 > 2SED$ . Significant at 5% level.

It can be seen that the experience of diarrhoea has a positive effect on the caretaker's attitude concerning the giving of fluids during the episode.

#### Should food be given to children with diarrhoea?

The resounding reply was "yes" by 91,0% of all caretakers independently of their experience with DD over the past year. Just over 8% replied that food should be withheld from children with DD. Less than 1% replied "I don't know" to this question.

#### Would you continue breast-feeding a baby with diarrhoea?

Over  $\frac{2}{3}$  of the respondents replied "yes" to this question (77,3% in the HDD and 79,6% in the NDD). Twenty percent (20%) in the HDD and 15,2% in the NDD replied "no" to this question (not significant).

#### Would you give an enema to your child if he/she gets diarrhoea?

It was disturbing to find that over 60% of all caretakers replied "yes" to this question (60,3% in HDD vs 64,1% in NDD).

#### Do you know any traditional medicines to treat diarrhoea?

Of 401 respondents, only 5 admitted to the above knowledge.

The names of the medicines mentioned were: SEKGALO in 2 cases; MOKGALO in 3 cases\*\*.

\* SED = 4,6

$p_1-p_2 = 28,1 > 3xSED$ . Significant at 1% level.

\*\* SEKGALO is the fruit of the shrub MOKGALO; the root of mokgalo is boiled and the water is used for treating bloody diarrhoea in humans and cattle (J. Phinias; personal communication).

### Assistance in cases of DD

About fifteen percent (15%) of the caretakers mentioned that they would attempt treating diarrhoea themselves before looking for any help. Of the remaining respondents, 13,8% would request the help of some other member of the community (mother, neighbour, grandmother); 77,6% would go either to the nearest clinic or to the hospital, which we believe reflects a high level of acceptance of our health services; 7,3% would take the child to a general practitioner and 1,3% to a traditional healer.

### ASPECTS OF DOMESTIC HYGIENE

We assessed only two aspects: the presence of pit-latrines in the household, and boiling of water.

#### Pit latrines

Pit latrines were present in the overwhelming majority of households (over 90%) and no difference was noticed between HDD and NDD.



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### Boiling of water before consumption

In NDD 66,9% of the households boil water before consumption vs 70,7% of HDD. This practice did not appear to have any effect on the proportion of children in the community or in a particular household getting diarrhoea and was not dependant on the number of children per household.

When we look at the reasons for not boiling water (Table 3.10) we see that almost all the reasons for not boiling water could be overcome by extensive health education.

**TABLE 3.10**  
**REASONS FOR NOT TREATING WATER BY BOILING**

REASON	NUMBER	%
Not useful	74	69,8%
Not enough fuel	1	0,9%
Other*	31	29,3%

### HOME-MADE SALT SUGAR SOLUTIONS \*\* (SSS)

#### Knowledge of caretakers

Sixty six (66) of 400 caretakers know how to prepare oral

rehydration solution *ie* 16,5%. Knowledge about ORS is not related to availability of a clinic in the village, type of caretaker (mother, grandmother or other), age of caretaker or attitude of mother to breast-feeding. There is a suggestion that caretakers knowing how to prepare SSS recognized more frequently death as a complication of diarrhoeal disease (72,7% vs 62,9% \*\*\* for caretakers not knowing how to prepare SSS). Of 152 respondents recognizing dehydration as a complication of diarrhoea, 60 (35,5%) know how to prepare SSS vs 6 (2,5%) that do not recognize dehydration as a complication of diarrhoea.

On the other hand 35 of the 65 respondents (53,0%) who knew how to prepare SSS recognized dehydration as an important complication of diarrhoea vs 35,0% (117/334) for those not knowing how to prepare SSS. Table 3.11 summarizes some of the above results in detail.

\* Not used to it, or not used to the taste of boiled water, or they did not know of any reason why they should boil the water.

\*\* We encourage and teach in our clinics the use of a solution consisting of 1 litre of cooled boiled water to which one level spoon of salt and 8 heaped teaspoons of sugar should be added.

\*\*\* Not significant.

**TABLE 3.11**  
**RELATIONSHIP BETWEEN THE OCCURRENCE OF DD, THE KNOWLEDGE ON HOW TO PREPARE SSS AND RECOGNITION OF DEATH AS A COMPLICATION OF DD**

	KNOWING HOW TO PREPARE SSS			NOT KNOWING HOW TO PREPARE SSS		
	HDD	NDD	HDD & NDD	HDD	NDD	HDD & NDD
<b>Total</b>	<b>34</b>	<b>32</b>	<b>66</b>	<b>116</b>	<b>218</b>	<b>334</b>
Recognizes death as a complication of DD	26 (76,5%)	22 (68,7%)	48 (72,7%)*	85 (73,2%)	125 (57,3%)	210 (62,9%)*
Recognizes dehydration as a complication of DD	18 (52,9%)	17 (53,1%)	35 (53,0%)**	46 (39,7%)	71 (32,6%)	117 (35,0%)**
Recognizes both death and dehydration as complications of DD	10 (29,4%)	7 (21,9%)	17 (25,7%***)	15 (12,9%)	0 (0%)	15 (4,5%***)

\* Not significant  
- SED = 6,5  
- p1-p2 = 9,8 < 2xSED

\*\* Not significant  
SED = 9,5  
p1-p2 = 18 < 2xSED

\*\*\* Not significant  
SED = 11,9  
p1-p2 = 21,2 < 2xSED

Probably significant: SED = 4,5  
p1-p2 = 10,3 > 2xSED

Sugar and salt are almost universally available. Proper sized spoons are available in the great majority of cases. Only one person said that no teaspoons were available at home, only 5 (1,3%) had spoons bigger than the reference size and 49 (12,8%) had spoons smaller than the standard size.

The limited availability of 1 litre measures (or is it ignorance of what 1 litre is?) is not really a limiting factor as long as we are aware of it when planning and delivering our health education.

### COMBINED RESULTS FOR THUSONG — BOPHELONG DISTRICTS

Our analysis was of a more limited scope.

#### INCIDENCE OF DD

Three hundred and ninety nine (399) households were visited. Of these 41,6% had at least one pre-school child

with diarrhoea. Of a total of 685 children under the age of five, 399, (28,9%) had at least one episode of diarrhoea over the past year.

#### MORTALITY OF DD

This data was also obtained from Gimbel and De Ruiter<sup>6</sup>. In their sample of 1 066 children under the age of 6 years there were 15 deaths (1,4%) and of these, 5 (33,3%) were due to DD. Of the deaths due to DD the ages in months were respectively 5, 9, 12, 14, 24.

**Over 80% of the caretakers did not know the cause of DD.**

#### KNOWLEDGE ABOUT SSS

Of 396 respondents, 34 (8,6%) knew how to prepare SSS. (Table 3.13).



**TABLE 3.13**  
**KNOWLEDGE ABOUT SSS (THUSONG/  
BOPHELONG)**

	HDD	NDD	TOTAL
Sample size	116	280	396
Knows	17	17	34
%	10,2*	6,1*	8,6

\* Not significant SED = 3,2 p1-p2 = < 2xSED

Part III to follow. In it the findings are discussed, conclusions are drawn and recommendations made.

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See Appendix IV on following page.

**Corrections — part one of the series**

The bottom line of Table 2.4 should read Well 7 (10,0%)  
The date for reference number 1 is 1980 (not 1982).

**APPENDIX V**

LEVEL OF EDUCATION	CARETAKERS OTHER THAN MOTHERS			MOTHERS			NDD	HDD
	NDD	HDD	TOTAL	NDD	HDD	TOTAL		
None	14 (26,4%)	19 (50%)	33 (36,3%)	49 (25,6%)	23 (22,3%)	72 (24,5%)	63 (25,8%)	42 (29,8%)
Sub A or B	2 ( 3,8%)	1(2,6%)	3 ( 3,3%)	3 ( 1,6%)	3 ( 2,9%)	6 ( 2,0%)	5 ( 2,0%)	4 ( 2,8%)
Standards I, II, III	16 (30,2%)	8 (21,0%)	24 (26,4%)	74 (38,7%)	27 (26,2%)	101 (34,3%)	90 (36,9%)	35 (24,8%)
IV, V	17 (32,1%)	6 (15,8%)	23 (25,3%)	46 (24,1%)	37 (35,9%)	83 (28,2%)	63 (25,8%)	43 (30,5%)
VI VII VIII	4 ( 7,5%)	3 ( 7,9%)	7 ( 7,7%)	17 ( 8,9%)	12 (11,6%)	29 ( 9,9%)	21 ( 8,6%)	15 (10,6%)
IX, X	0	0	0	1 ( 0,5%)	1(1%)	2 ( 0,7%)	1 ( 0,4%)	1 ( 0,7%)
Post Matric	0	1 ( 2,6%)	1 (1,1%)	1 ( 0,5%)	0	1 ( 0,3%)	1 ( 0,4%)	1 ( 0,7%)
TOTAL	53	38	91	191	103	294	244	141

# Active Rheumatoid Arthritis?

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Decrease in number of affected joints. Decrease in pain. Decrease in morning stiffness.	<b>3-4 months</b>
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## APPENDIX IV COMMUNITY SURVEY ON GASTROENTERITIS

### DETAILS OF THE RESPONDENT

Village: .....

Relationship to underfive child .....

Mother .....

Grandmother .....

Other .....

Age: .....

School level: .....

Did you breast-feed your babies? .....

YES	NO
-----	----

1. How many children (under five years) are there in the household? .....

2. How many children (under five years) had diarrhoea last year? .....

3. How many children (under five years) died last year? .....

4. How many children (under five years) died due to diarrhoea last year? .....

5. Do you have a toilet at home? .....

YES	NO
-----	----

6. How do you know when your child has diarrhoea? .....

7. What causes diarrhoea in children? .....

8. Is diarrhoea a .....

DISEASE	NORMAL	I DON'T KNOW
---------	--------	--------------

9. Can a child die from diarrhoea? .....

YES	NO	I DON'T KNOW
-----	----	--------------

10. Should liquids be given when your child gets a diarrhoea? .....

YES	NO	I DON'T KNOW
-----	----	--------------

11. Should food be given to children having diarrhoea? .....

YES	NO	I DON'T KNOW
-----	----	--------------

12. Would you continue breast-feeding a baby with diarrhoea? .....

YES	NO	I DON'T KNOW
-----	----	--------------

13. Would you give an enema to your child if he gets diarrhoea? .....

YES	NO
-----	----

14. If your child gets diarrhoea would you: .....

Treat it yourself? .....

Go to someone to help you? .....

15. Whom in the community would you go to for assistance if your child gets diarrhoea?:

Mother .....

Grandmother .....

Traditional doctor .....

Clinic .....

Hospital .....

Private doctor .....

Neighbour .....

16. Do you know any traditional medicines to treat diarrhoea? .....

YES	NO
-----	----

If YES, mention the name: .....

17. Do you have sugar at home? .....

YES	NO
-----	----

18. Do you have salt at home? .....

YES	NO
-----	----

19. Have you got teaspoons at home? .....

YES	NO
-----	----

20. Have you got a one litre measure at home? .....

BIGGER	SMALLER	SAME SIZE
--------	---------	-----------

YES	NO
-----	----

21. Do you boil your drinking water? .....

YES	NO
-----	----

If YES — Once a day .....

— Twice a day .....

— More frequently .....

If NO — Why not? Not useful? .....

Not enough fuel? .....

Any other reason? .....

22. How do you keep your water clean after boiling it? .....

23. Can the babies become dry as a complication of diarrhoea? .....

YES	NO	I DON'T KNOW
-----	----	--------------

24. What are the signs and symptoms of dehydration? .....

Name Two: .....

25. Do you know how to prepare oral dehydration solution at home? .....

YES	NO
-----	----

(Patient must tell you how to prepare it)