

SECOND CARNEGIE INQUIRY INTO POVERTY
AND DEVELOPMENT IN SOUTHERN AFRICA

Infant mortality in Naphuno 1:
Initial results

by

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SUMMARY

We interviewed women between the ages of 15 and 59 years in the Naphuno 1 district near Tzaneen, to elicit information about pregnancies between 1972 and 1982.

We found:

- 1) An infant mortality rate of 73/1 000.
- 2) After the first week of life, the major causes of death for infants as given by the mothers were gastro-enteritis, lekone, kwashiokor, and measles.
- 3) 85% of mothers had contact with conventional health services during pregnancy, at least once, although only 49% of the babies were delivered at the health service.
- 4) 91% of babies were breastfed until they were one year old. Thirty-nine percent of the babies had been given other milk by the age of one year.

1. Introduction

The survey was done in the Naphuno 1 district in the north eastern Transvaal, about 20 km south-east of Tzaneen. Naphuno 1 covers an area of about 200 km², with a population estimated at about 90 000 in 1980. About 10 000 of Naphuno's population live in the Lenyenye Township. In Lenyenye people live in brick houses, systematically arranged in streets. The houses have running water and water-borne sewerage. Most adults in Lenyenye commute to Tzaneen every day for work while others work as migrant labourers in other big Transvaal towns. The majority of Naphuno's population lives in the rural areas surrounding Lenyenye comprising the Maake and Mogoboya districts. In some areas households are in close proximity while in others the households are scattered. Although most of the people live in thatch roofed, mud houses, some have been built with bricks. The people in these rural villages survive mainly on a rural subsistence economy with injection of cash from migrant labour in the Transvaal. The Agricultural Department of the Lebowa Government has attempted to allocate each household with a numbered plot. It is estimated that about 80% of households have been allocated these numbered plots. (Personal communication: Agricultural Officers, Lebowa Department of Agriculture, Lenyenye.)

Infant mortality and child mortality rates have been recognised as important indices of the health status of communities. They can also be used to monitor improvement or deterioration in the health status of a community. In addition, knowledge of the causes of childhood

mortality can be used by health departments to define their immediate priorities. (1) However, very little information is available on mortality of children in rural areas of South Africa. (Irwig L M and Ingle R F. Childhood mortality rates, infant feeding and health service use in rural Transkei. Submitted for publication to S Afr Med J.) In developed countries information about childhood mortality can be acquired from registers of birth and death. However, in the rural areas of South Africa births and deaths are not routinely registered. Recently Irwig and colleagues undertook a childhood mortality study in the Transkei. (Irwig et al. Childhood mortality rates, infant feeding and health service use in rural Transkei. Submitted for publication to S Afr Med J.) We decided to do a similar study in Naphuno 1 and to adapt the questionnaire they used in their study.

Our study had the objective of answering the following questions about Naphuno 1:

- i. What is the infant mortality rate?
- ii. What are the leading causes of post-perinatal infant deaths?
- iii. To what extent are the maternal and child health services utilised?
- iv. What are the feeding patterns of early childhood?

2. Methods

Our study was a descriptive one which relied on recall to obtain information on vital events in the previous ten years.

2.1 Study Population

Our study population consisted of all de jure children born in Naphuno 1 between 1972 and the time of the survey. These were the children who usually resided in Naphuno 1.

Children were included if they had lived in Naphuno 1 for more than 6 of the previous 12 months or, if dead, for more than 6 of the 12 months before death. Children who were between 1 and 12 months old, or had died within this age group were included if they had lived in Naphuno 1 for more than half their lives. Stillbirths and children under one month of age were included if their mothers had lived in Naphuno 1 for more than 6 of the 12 months before the child was born.

2.2 Sampling Method

We decided to sample 3% of households. In Mogoboya we randomly sampled, from the list of stands, clusters of one household, while in Maahe and Lenyenye we randomly sampled clusters of 3 households. In villages where a list of stands was not available as a sampling frame, households were sampled haphazardly while attempting to eliminate any obvious bias.

2.3 Questionnaire Design

We adapted the questionnaire used by Irwig and colleagues in the Transkei Childhood Mortality Study. (Irwig et al. Childhood mortality rates, infant feeding and health service use in rural Transkei. Submitted for publication to S Afr Med J.) We developed a new methodology for determining the causes of death.

Prior to designing the questionnaire a large number of group discussions was held with local people to gather a list of causes they attributed for their children's death. This information was used in designing our questionnaire. The causes of death as stated by the mothers were recorded without attempting to translate these into conventional medical terms. If the cause of any death was not given spontaneously, attempts were made to establish the cause of death by prompting. This was done by reading out the whole list of possible causes in the questionnaire and asking the mother which of the mentioned causes she thought the child died of. In addition, the signs and symptoms which accompanied the child's terminal illness were recorded, both with and without prompting.

2.4 Implementation of the Study

The questionnaire was extensively piloted. Two of us (CN and KM) did all of the interviews between May and November 1983. In Lenyenye township the stands are systematically numbered and therefore the households in the sample were easy to identify. However, in the rural areas stands were allocated numbers according to the date of occupation of the stand and therefore the stands were not systematically numbered. Therefore, to locate households in the sample often required intensive searching. Women between the ages of 15 and 59 in the study households were interviewed. If the woman was absent information was obtained from relatives within the household. Information was obtained for all pregnancies since 1972 relating to the objectives as outlined previously.

2.5 Analysis of data

To analyse our data we used the Statistical Analysis System⁽²⁾ and BMDP Statistical Software.⁽³⁾

The infant mortality rate was calculated as the proportion of live births between 1973 and 1982 who died before 1 year of age and was expressed as a rate per 1 000 live births.

The perinatal mortality rate was calculated as the proportion of still births and live births who died in the first 7 days after birth and was expressed as a rate per 1 000 births. If a baby cried or breathed after delivery it was considered to be a live-birth. Babies who did not cry or breathe after birth were defined as stillbirths if the duration of pregnancy was more than 28 weeks and as miscarriages if the duration of pregnancy was 28 weeks or less.

3. RESULTS

3.1 Response Rates

Our study sample consisted of 381 households. Of these, 348 (91%) were found. We obtained information about 643 (97%) of the 664 women between 15 and 59 years of age who were in these households.

3.2 Childhood Mortality Rates

The total number of pregnancies of women in the study sample between 1973 and 1982 was 824, of these 22 ended as miscarriages and 23 as stillbirths. Of the babies born alive there were 57 deaths before 1 year of age, 18 of them in the first week of life. For the years 1973 to 1982 combined therefore the Perinatal Mortality Rate was 51 per 1 000 births (41/802). The Infant Mortality Rate for the years

1973 to 1982 combined 73 per 1 000 live births (57/779). The ages of live births who died before 1 year of age are shown in Table I. Ninety-five percent confidence limits for the Infant Mortality Rate are between 57.7 and 95.5 assuming simple random sampling of an infinite population.⁽⁴⁾ The true confidence limits will be slightly wider because of the cluster sampling.⁽⁵⁾ The finite population correction factor has little effect on the confidence limits.

3.3 Causes of post-perinatal infant deaths as given by the mothers

The causes of death for infants born between 1973 and 1982 who died after 7 days are shown in Table II. The Northern Sotho name for the cause of death was translated into English unless there was disagreement among health workers in Naphuno 1 as to its English equivalent or if the cause of death was not a recognized medical condition. In each case, where there was an English equivalent, the signs and symptoms given were compatible with the disease as we understood it. The signs and symptoms for the common non-translatable disease Lekone are given in Table III. The description of the one patient who died of Marota appeared to be a description of infected chicken pox.

3.4 Use of the health services

There were 170 live births to mothers in the sample in the two years prior to their being interviewed. The percentage of mothers who had ante-natal care from different sources is shown in Table IV. Eighty-five percent of mothers had been seen by either a private doctor,

at a clinic or hospital before delivery. The place of birth for the children born alive in the previous 2 years is shown in Table V.

•Forty-nine percent of the children were born at either the clinic or the hospital.

3.5 Feeding patterns

Ninety-seven percent of children were breast-fed. Using life-table analyses (BMDP 1L program)⁽⁶⁾ we estimated the length of breast-feeding and found that 91% were still being breast-fed at one year of age (Table VI). Similarly we estimated when other milk was introduced (Table VII) and found that 39% had been given other milk by one year of age.

DISCUSSION

We had expected to find a higher infant mortality rate. In the Transkei study Irwig et al found an infant mortality rate of 130 per 1 000. (Irwig et al. Childhood mortality rates, infant feeding and health service use in rural Transkei. Submitted for-publication to S Afr Med J.) As we had expected, gastro-enteritis was the most common cause of death.

The second most common cause of death given was lekone. This is a disease well known in Naphuno and the surrounding area. The belief is that babies who are born with a red patch on the back of the neck or a rash on the mucus membranes of the mouth need to be treated traditionally. If not, a rash will later appear in their brain, lungs or gut and this may lead to death. Sometimes this fine papular rash may appear cutaneously or in the mucus membranes of the mouth. The presentation of the illness is usually acute with previously healthy babies dying within a few days. Although lekone is not a recognised medical condition we do not feel that it should be dismissed as superstition but should be investigated more thoroughly.

The fact that 85% of mothers attended a conventional health service for ante-natal care at least once makes some health education possible, but we cannot at present comment as to whether this attendance benefits mother or baby.

Breastfeeding is very common and continues for a long time. Other milk is introduced quite late.

Fewer children were breastfed for the whole of the first year of life in the Transkei and more had received other milk by the end of the first year (Irwig et al. Childhood mortality rates, infant feeding and

health service use in rural Transkei. Submitted for publication to S Afr Med J). Whether this difference in feeding patterns contributes to the difference in infant mortality rates requires further investigation.

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REFERENCES

1. Chen L, Rahman M, and Sarder A M.
Epidemiology and causes of death among children in
a rural area of Bangladesh, 1.
Int J Epidemiol. 1980; 9: 25-33.
2. SAS User's Guide: Basics 1982 Edition.
Cary. North Carolina: SAS Institute Inc., 1982.
3. Dixon W G, Chief Editor.
BMDP Statistical Software 1981.
Berkeley, California: University of California Press, 1981.
4. Diem K and Lentner C Eds.
Scientific Tables, 7th Ed.
Basle, Switzerland: Ciba Geigy Ltd, 1970: 90.
5. United Nations Economic Commission for Africa.
Manual of demographic sample surveys in Africa.
Geneva: UNESCO, 1974, Ch. 7.
6. Dixon W G, Chief Editor.
BMDP Statistical Software 1981.
Berkeley, California: University of California Press, 1981.
557-574.

TABLE I Age at death of Naphuno 1 infants dying in period 1973-1982

Age at death	Frequency	Percentage
Early neonatal (1-7 days)	18	32
Late neonatal (8-28 days)	10	18
1 - 2 months	2	4
2 - 3 months	3	5
3 - 4 months	7	12
4 - 5 months	2	4
5 - 6 months	3	5
6 - 7 months	2	4
7 - 8 months	1	2
8 - 9 months	-	-
9 - 10 months	-	-
10 - 11 months	2	4
11 - 12 months	7	12
TOTAL	57	102

TABLE II Causes of post-perinatal deaths in Naphuno 1, 1973-1982

Cause	Frequency	Percentage
Gastro-enteritis	11	28
Lekone	7	18
Kwashiokor	3	8
Measles	3	8
Accidents	2	5
Pneumonia	2	5
Prematurity	1	3
Abdominal distension	1	3
Cough	1	3
No illness, just died	1	3
Marasmus	1	3
Marota	1	3
Whooping cough	1	3
Unknown	4	10
	TOTAL	39
		103

TABLE III Signs and symptoms given for Lekone

Signs and symptoms given	
Child 1	fever, rash
2	diarrhoea, vomiting, rash
3	fever, rash, breathlessness
4	fever, breathlessness
5	fever, diarrhoea, rash, breathlessness
6	diarrhoea, vomiting, rash
7	diarrhoea, vomiting, rash

TABLE IV Percentage of mothers who had ante-natal care
from different services,

Service	Percentage of mothers attending
Private doctor	10%
Clinic	58%
Hospital	38%
Experienced lay person	2%
Elsewhere	1%

TABLE V Place of birth for children in Naphuno,

Where child born	Frequency	Percentage
Home	86	51
Clinic	21	12
Hospital	62	37
Unknown	1	1
TOTAL	170	101

TABLE VI Percentage of children still breast-fed
at end of different periods

End of period (weeks)	Percentage
10	97
21	97
31	93
42	91
52	91
62	85
73	81
83	67
94	55
104	55

TABLE VII Percentage of children given other milk
at end of different periods

<u>End of period</u> <u>(weeks)</u>	<u>Percentage given other milk</u> <u>by end of period</u>
10	16
21	29
31	36
41	37
51	39
62	45
72	45
82	45
92	49
103	49

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Quoting (in context) from these preliminary papers with due acknowledgement is of course allowed, but for permission to reprint any material, or for further information about the Inquiry, please write to:

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