

ASPECTS OF PRIMARY HEALTH CARE

IN A RURAL KWAZULU COMMUNITY

A Descriptive Study and Literature Survey

CPD EMERSON, MBChB

1990

DEPARTMENT OF COMMUNITY HEALTH

UNIVERSITY OF NATAL

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the requirements for
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DECLARATION

This dissertation is the candidate's original work and has not been submitted in any form to another university.

The sources of data have been duly acknowledged in the text.

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SUMMARY

1. Bomela presents the profile of a typical developing community characterised by the cycle of poverty (due to unemployment and low education standards) and infectious diseases (measles, gastroenteritis and pneumonia).
2. The age and sex structure of the Bomela community is that of a developing community, with 42% of the population being under 16 years of age and only 3% being 65 years and over. "School attenders" (6-16 years) represented 27% of the population. Males in the working age group (16-64 years) still appear to be migrating to large urban areas, e.g. Durban and Johannesburg.
3. In those aged 6 years and greater, 14% had not received any formal education - 6 years being the age of compulsory school commencement. Fifteen percent of children aged 6-16 years do not attend school. There is no statistically significant difference between school attendance rates of males and females. Seventy two percent (72%) of females and 65% of males aged between 16 - 44 years had not achieved Std.8 level of education. Fifty percent of the population (50%) do not continue schooling beyond Std.4. Standard of education achieved was not significantly associated with gender.

4. Thirty percent (30%) of males and fifty-eight percent (58%) of females >16 years of age were neither school pupils or employees. This is one indication of the poor economic circumstances of the area and is of considerable relevance to any future development programmes. People in receipt of single care grants and Disability pensions represented only 2% of the population.
5. The dependency rate for the Bomela community (0-15 years + >64 years + Disabled / 16-64 years) was 49%. This figure excludes, however, the unemployed between the ages of 16 and 64 years. It is apparent that economic dependency is one of the major problems faced by this community which requires the urgent and concerted attention of local and central economic, education and health planners. The determining of priorities and the allocation of resources should, it is considered, be influenced by the age structure of this community (15% less than 5 years of age), taking into account the high dependency rate and unemployment together with the high drop-out rate of school children.
6. The average number of people per household and the "crowding index" (residents sleeping per room) were 8,4 and 3 respectively. This relatively high crowding index has social as well as infectious disease implications.

7. It is disturbing to note, that in a community adjacent to a wealthy farming community (Paddock) and a mere 20 kilometres from a large town (Port Shepstone) that 38% of the households had no access to any form of toilet. This excludes those who have access but do not utilise the facility. The level of education of the household head was significantly associated with the presence or absence of a toilet.
8. Refuse disposal (either pits or burning) was practised in 140 households (70%).
9. Thirty-eight percent (38%) of households were more than 500 metres from a water supply and a further 42% had to travel between 200-500 metres.

The main source of water in the community is spring water (64%), followed by rivers (27%). Six of the springs are at present "protected". Two boreholes are available for community use, however one has failed mechanically after less than 1 year and, as the community members feel they cannot afford the cost of repair, remains unrepaired. The relative advantages of borehole provision compared with spring protection, where perennial springs exist, is a matter for debate.

10. It is encouraging to note that 65% of households had a garden with at least 2 vegetables (excluding maize) or shared in a communal garden scheme. It is even more encouraging that this figure has improved since the study was carried out (personal communication with clinic staff), as since then at least 2 communal garden schemes have commenced.
11. Measles is a major problem causing 11% of significant episodes of morbidity (26% in children under 2 years). Only 45% of children aged 12-23 months are known to have been immunised. This means that either the RTHC is not utilised effectively as a vaccination recording system or the immunisation coverage rate for measles is low.
12. Gastro-enteritis accounted for at least 13% of episodes of significant morbidity in children under 5 years of age, and 20% of morbidity episodes in children under 3 years of age. Thus it remains a major problem and directs attention to addressing the associated factors of poor hygiene, poor quality and quantity of water and lack of basic health education.
13. Pneumonia ("significant" - see definitions) accounted for 25% of episodes of significant morbidity and, if this figure is combined with episodes diagnosed as Pertussis, the figure for significant respiratory tract infection is 31% of the

significant morbidity episodes. If one associates Pneumonia with poor housing, over-crowding, exposure, malnutrition and lack of immunisation then clearly these factors constitute priority problems to be tackled in the community.

14. Burns and "paraffin ingestion" occur too frequently, especially in those aged 2 years and under. Maternal education is likely to be of assistance in the reduction of paraffin related injuries.
15. Measles, gastro-enteritis and respiratory tract infections were responsible for 79% of known causes of death in children. This is typical of the "mortality" profile of developing communities and all 3 conditions can, to an appreciable extent, be prevented or treated using PHC principles. Sixty-three percent of deaths of children occurred in those under 1 year of age, suggesting a high IMR. If this high IMR is the case then both socio-economic circumstances and health care are likely to be associated as is characteristic of developing countries.
16. Almost half of the child deaths (49%) occurred at home. Of these 79% occurred to those under 2 years of age. This would lead to difficulties in assessing true IMRs and U5MRs. That so high a proportion of child deaths occurred at home is a cause for concern as it raises the question "are health

facilities acceptable and/or accessible to the community?"

17. Seventy percent of children under the age of 6 years and 85% of those under 4 years of age were in possession of a RTHC. This represents a good foundation for the use of RTHCs as a "record tool" for growth and immunisations. A discouraging feature was that only 42% of available RTHC's were "up-to-date" which represents 28% of the total number of children under 6 years of age. This indicates that the mere presence of a RTHC does not mean that it is effectively used. A priority is thus to reassess the value and role of the RTHC in Bomela and to address these findings.
18. It was encouraging that 61% of households were aware of ORT for treating gastro-enteritis and, of these households, 61%, knew how to make ORS. Therefore, of the households surveyed, 37% were capable of making ORS. However, knowledge does not necessarily lead to practice and this was confirmed by the finding that only 26% of households who knew how to make ORS had used ORT in gastro-enteritis, representing 9% of the 200 households interviewed.

A programme to encourage the use of ORT/ORS in the Bomela community is needed. Awareness of ORT would appear satisfactory but room remains for improvement in the use of ORT. Mass media (e.g. Radio Zulu), church leaders and school

teachers should be utilised more to create awareness and to promote subsequent use. There was a statistically significant association between maternal education and knowledge on how to make ORS.

19. The finding that only 5% of infants had not been breast fed at all or had been breast fed for less than 1 month was encouraging. Eighty-one percent (81%) of infants had been breast fed for 4 or more months. Fifty-two percent (52%) of mothers gave weaning at 9 months or later as the reason for stopping breast feeding.
20. BCG immunisation coverage is estimated to be 80% in the community.

Immunisation against measles was confirmed as having occurred in 45% of children between 12-23 months of age, compared with the 24% known coverage of children aged 2 years and older. The immunisation state of 40% of children was unknown. This is unsatisfactory and ways need to be sought to increase coverage and to improve existing methods of recording immunisations for the community.

Polio immunisation was assessed as being complete in 27% of children (for age) up to age 6 years and incomplete (for age) for a further 33%. This was inadequate, as was proved by the

epidemic which followed 3-4 months after completion of the study (August 1987).

For immunisation programmes to be successful much careful planning and monitoring is required. Supply of vaccines to the Bomela clinic (until recently) has not been a problem. The efficacy of the vaccines administered has not been tested and the information on population coverage would at this time appear to be deficient. Priority should be given to extending coverage into the community and of keeping satisfactory records for future information purposes.

The clinic is the facility most used by the community for vaccination and attention should now be given to allowing clinic nursing staff to enter the community in order to increase coverage.

The immunisation rate of children was not significantly associated with level of maternal education.

21. Maize and bread appear to be the staple diet in pregnancy. The protein intake appears to be low, with only 33% eating meat or fish more than 3 times per week.
22. It was interesting to note that 60% of families had less than 3 children alive and 74% had less than 4 children alive. Only

7% of families had more than 5 children alive. These figures taken in conjunction with the high number of children under 5 years of age could suggest a high under 5 years mortality rate (U5MR).

23. It was encouraging to note that 90% of mothers in the study were aware of the existence of family planning, however 42% had never used a family planning method.

Of 341 women, (mothers and other) 47% claimed to have used or were using a Family Planning method.

The above figures are not discouraging when one considers that there is likely to be a high U5MR in the Bomela community. Fertility declines as IMR and U5MRs decrease and Family Planning independently contributes very little (an estimated 5%) to declines in Crude Birth Rates (CBR). Family Planning, although important would not appear to be a priority at present.

24. A discouraging feature of the study was that 38% of the youngest children were born at home and that there was no apparent association between place of birth and level of maternal education. The number of women delivering at home who had attended Ante- natal clinics prior to delivery was unfortunately not determined. This high home delivery rate

is unsatisfactory unless facilities at home can be significantly improved and TBAs can be appropriately trained and motivated to co-operate with the clinic health delivery system.

25. Notwithstanding that 60% of the sample population lived within 1 hour of the clinic (well within the time recommended by WHO and others) and all lived within 4 kilometres:
- (i) many births and deaths continue to occur at home
 - (ii) other health workers are used in preference to the clinic
 - (iii) immunisation coverage is unsatisfactory.

The reasons for this may be numerous and varied and are not addressed in the present study. However, as the clinic is physically accessible to all members of the community the reasons for its non-use in these cases is likely to be due to other factors, which may include acceptability of the service, its affordability and undiscovered cultural characteristics.

The majority (60%) of the population walk to the health facility of choice for advice on minor illnesses.

26. Traditional healers play an important role in the community and co-operation between clinic staff and these workers needs to be nurtured.

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INTRODUCTION

"There appears to be widespread dissatisfaction of populations about their health services for varying reasons. Such dissatisfaction occurs in the developed as well as in the third world. The causes can be summarised as: a failure to meet the expectations of populations; an inability of the health services to deliver a level of national coverage adequate to societies; a wide gap (which is not closing) in health status between countries, and between different groups within countries; rapidly rising costs without a visible and meaningful improvement in service, and a feeling of helplessness that the health services and the personnel within them are progressing along an uncontrollable path of their own which may be satisfying to the health professional but which is not what is most wanted by the consumer".⁽¹⁾

This statement was extracted from a report by the South African

Medical Research Council on a seminar on community-based essential health services in South Africa. This report also recognised that, although the roots of the crisis in health care delivery were identified as the health services, the crisis would not be solved by simply reforming the health system but rather suggested that health care delivery needed to be considered as part of a broad community development programme. These arguments are similar to those embodied in the 1978 ALMA - ATA declaration on Primary Health Care (PHC).⁽²⁾ Beginning in the 1970's and still ongoing, PHC has established itself as the basis for WHO's global strategy entitled "Health for All by the Year 2000". By this strategy WHO anticipates "that as a minimum, all people in all countries should have at least such a level of health that they are capable of working productively and of participating actively in the social life of the community in which they live".⁽³⁾

One is aware of the current debate regarding selective PHC and comprehensive PHC, however, GOBI-FFF is one of the methods selected by UNICEF to attain this lofty goal of "Health for All by the Year 2000." It is recognised that GOBI-FFF seeks to aim at prevention of disease, as opposed to promotion of health (as envisaged at ALMA-ATA), but nevertheless GOBI-FFF is a method of PHC delivery currently being widely implemented and evaluated.

"A review of the current health status highlighted the paucity of relevant information. Available information relates largely to

mortality which reflects not only the "tip of the health status ice-berg" but possibly the "wrong ice-berg".⁽⁴⁾

This statement introduced the report on the "THE CURRENT HEALTH STATUS AND PRIMARY CARE NEEDS" - the findings of a Medical Research Council (MRC) seminar on community-based essential Health Care Services in Southern Africa (1987). The same report states - "The GOBI-FFF strategy promoted by UNICEF has been shown to be effective in many other areas in the world with similar health conditions and should be vigorously applied".⁽⁵⁾

The present descriptive study and accompanying literature survey was undertaken to obtain a base-line of information on certain demographic and other indices related to GOBI-FFF (see Abbreviations) in an area of KwaZulu served by a clinic which is staffed with trained nurses, has facilities for referral to community hospitals and has satisfactory road and telephone communications during most of the year. This information is important in determining health priorities and to subsequent evaluation of the health care delivery system. It is anticipated that this study will supply some information relevant to those delivering health care to the population of Bomela with respect to GOBI-FFF status and certain environmental circumstances and to other similar rural areas.

Policy decisions at any level, about health care, must be based on

recent, relevant data about health and sickness in a population. The information obtained during this study is recent and relevant with respect to GOBI-FFF and some environmental circumstances in the area of study (August 1987).

Epidemiology is concerned with the health status of communities as distinct from that of individuals. Indeed the ultimate goal of epidemiology is to improve the health status of populations. Descriptive epidemiological studies, notwithstanding their shortcomings as an evaluative tool, are of value in describing the impact of disease in a particular community.⁽⁶⁾ Surveys may be used to motivate local health workers as a means of providing important base-line information upon which the effectiveness of later interventions can be measured.⁽⁷⁾

This study was carried out for both reasons, (description and motivation) recognising that the results will, of necessity, exclude base-line data on much of the morbidity to be found in the community studied and, due to the relatively small sample size ($n = 200$ households), important vital statistical rates such as Infant Mortality Rates and Fertility Rates will remain unknown.

OBJECTIVES

The objectives of this descriptive baseline study are to:-

1. Determine in respect of the study area:
 - i) The size, age and sex structure of the resident population
 - ii) Aspects of socio-economic status and environmental circumstances
 - iii) Morbidity and mortality information for children under 5 years of age
 - iv) Community awareness and practice of GOBI-FFF
 - v) Patterns of utilisation of health care resources
2. Submit recommendations, based upon the above findings, which are relevant to:-
 - i) future objective health care planning
 - ii) resource allocation.

DEFINITIONS

1. GOBI-FFF. The acronym defined by UNICEF which describes:
Growth monitoring of children by use of growth charts
Oral rehydration therapy
Breast-feeding
Immunisation
Female education/literacy
Food supplements (mother and child)
Family spacing
2. Rural Kwa-Zulu Community:- Bomela area, situated 10kms West of Port Shepstone, Natal. The area falls under the jurisdiction of the KwaZulu Government.
3. Demography:- size of, and age and sex structure of the population in the area studied.
4. Socio-economic status: As indicated by rates pertaining to educational level, economic activity, disability grant recipients, single care grant recipients and Dependency ratio.
5. Environmental circumstances:- crowding density (number of people per room used for sleeping); availability of water, (source and distance), sanitation and refuse disposal methods

used and presence of a food garden containing at least 2 vegetables excluding maize.

6. Morbidity Information:- Pneumonia, Poliomyelitis, Pertussis, Tuberculosis, Measles and Gastroenteritis in the previous 6 months (children under 5 years). Illness attributed to the following conditions based on clinical diagnosis at a health facility or as determined and expressed by the mother using recognised local Zulu terms for the disease (see Annexure B for Zulu definitions of these illnesses).
7. Mortality Information:- cause of death (if known) and age at death of under 6 year olds in sampled households in the previous 5 years as diagnosed by health facility or the mother.
8. Household Garden:- any garden belonging to a household or the community which grows at least 2 vegetables/fruit in addition to maize.
9. Toilet facility:- Any pit (latrine) with a surrounding structure which was used by a household for sanitation facilities. (Other types of toilet are unavailable in the study area).
10. Growth Chart:- Any chart designed for the continuous growth

monitoring of children (<6 years) and recording of immunisations was accepted, as no standardised chart exists in the RSA.

11. Breast-feeding:- Feeding the infant with breast milk only, up to the age of 4 months after which "weaning" foods may be introduced with the continuation of Breast Feeding. Weaning (per se) was taken to mean the period of cessation of breast milk when it was felt that the baby could cope with an adult diet and in this study was assumed to be a normal occurrence from the age of nine months.
12. Mother:- in the context of the questionnaire data included mothers and child minders >18 years old.
13. "Selected conditions" :- The illnesses listed under morbidity (see questionnaire Annexure C) e.g. pneumonia, were identified by the community using "local terminology". See Annexure B for the Zulu terms accepted as being significant episodes of morbidity for the purposes of this study. For instance one of the terms used in the Zulu language referred to intercostal/subcostal recession as "pneumonia" of a significant degree. For the purposes of this study a "selected condition" was one which the researcher felt was common and easily identifiable by members (mothers) of a rural community.

14. Significant condition (morbidity):- Any of the above selected conditions which necessitated a visit to consult a health worker.
15. Whooping Cough:- Respiratory condition lasting for at least one month and associated with vomiting after the child coughed.
16. The "chi-square" test for significance of association has been calculated with Yate's correction using the EPIINFO software programme, throughout the text.

REDUCTION OF BIAS

For the purpose of this study, no control group was considered necessary, as this was a descriptive study, on a single community to obtain baseline data on the current status of the conditions studied.

1. Protocol: A research protocol was established prior to the commencement of the study and, after an initial pilot phase, was adhered to throughout, except for submission dates due to factors beyond the control of the researcher. (Annexure A).
2. Sampling: Cluster sampling, based on recent aerial photographs of the area, was the method of sampling used. Each head of a household and/or senior mother (if she was the head) in a randomly selected cluster of households was interviewed. The sample size was estimated to be 11% of the dwellings of the target population. (See Method).
3. Standard Questionnaire: Information was collected using an interviewer administered standard precoded questionnaire. (Annexure C).
4. Training of Interviewers: Each interviewer was fully briefed

by the Researcher. Interviewer's were drawn from the same locality and social and ethnic groups as the respondents.⁽¹³⁾ (See Method of Data Collection for more details).

5. Absentee and Non-respondent management: Respondent's (mother's or child minders over 18 years of age) who were not present at the time of the initial visit were visited by arrangement at a subsequent visit. Non-response was minimised by obtaining co-operation from the local tribal authority and by using as interviewers, local community members of the same sex as the respondents. (In only 1 household (out of 201) was an interview refused).
6. Recall Facilitations: "Selected conditions" (see questionnaire and Annexure B) were used in the questionnaires to aid recall.⁽¹³⁾ Only illnesses, in the previous six months in children under 6 years, which required (as perceived by family) some form of medical intervention (including traditional) were included to decrease the response errors associated with recall and culturally determined factors. (For discussion see Literature Survey).
7. Pilot Study: A Pilot study was conducted on households in the area of study. Each interviewer visited 2 dwellings and the completed questionnaires were reviewed in the light of problems experienced by the interviewers and by the

Researcher.

8. Validation of Data: During the Pilot study, each household which had been visited and interviewed by one of the interviewers was again visited the following day by the researcher and one of the other interviewers and again the questionnaire was used. This led to a check on 8 households. During this validation phase it was found that 2 of the interviewers (4 out of 8 questionnaires) had assumed that a garden at a household simply meant the presence of any one vegetable, one of the interviewers (2 out of 8 households) accepted the information given by the mother regarding immunisation for DWT/Measles without checking the RTHC for recording of the immunisations and it was discovered that in one household (1 out of 8) the mother who claimed to have breast fed her baby had in fact combined breast-feeding and bottle feeding up to 4 months. This led to a further clarification of these issues with the interviewers and the questionnaire was not modified.

Validation of the data in the actual study was not carried out however due to resource limitations. It is considered however that as the only errors encountered in the pilot study were attributable to misunderstanding terms and, as these were corrected in the pilot study, the data are likely to be reliable within the limitations of the study.

METHOD OF DATA COLLECTION

Study Area

Bomela (the "catchment area" for Murchison Hospital), is a rural area of KwaZulu with an estimated population of 16 000. It is situated in the Izingolweni Magisterial District, approximately 10 kms West of Port Shepstone, on the Natal South Coast. By road it is 16 kms to Port Shepstone Provincial Hospital and 20 kms to Murchison Hospital - both of which act as referral centres for the clinic in the area.

The Bomela community is well established and stable, many of the residents having lived in the area for over 30 years.

The area is served by a peripheral clinic which is staffed by 2 Professional Nurses and a State Enrolled Nurse (1987) and provides a 24 hour service, 7 days a week. The clinic is visited by a Medical Officer from Murchison Hospital once a fortnight.

For the sake of administrative convenience the Bomela area is divided into 2 areas (determined by an arbitrary line drawn on the map) to determine referral cases to either Port Shepstone hospital or Murchison Hospital. The population studied (approximately 1 800 dwellings) comprise those people who would in the normal

course of events be referred to Murchison Hospital.

The majority (approximately 75%) of the houses are of the traditional mud and wattle, rondavel-type construction. The number of "western type" houses built with clay blocks or bricks is increasing however.

Authority to Conduct the Survey

Permission to conduct the survey was sought and obtained from the local authority Chief. Authority was also obtained from the KwaZulu Department of Health and the Medical Superintendent of Murchison Hospital who is responsible for supervising the health-related activities of Bomela clinic in conjunction with the Matron of Murchison Hospital.

Funds to carry out the Survey

Funds to pay interviewers and to cover a portion of the travel expenses were granted by the University of Natal, Faculty of Medicine Research Fund.

Determination of Sample Population

Using aerial photographs of the area, carried out in August 1986 (9 months prior to the Study), by the Air Survey Company of Africa

LTD for the KwaZulu Government, the number of dwellings for the area under study were identified and manually counted. It was decided to interview 200 (11%) households after estimating that approximately 1 800 households existed in the area.

Using a 1 in 5 000 aerial photograph to identify dwellings the area was divided into clusters of 40 adjacent dwellings each. These clusters were not of equal geographical size as the housing density for the area varied but an attempt was made to form clusters with as near a circle or square shape as possible. This yielded 45 clusters, 5 of which were randomly selected using a random number table. Each cluster was then divided into 4 groups of 10 dwellings and 1 of the 4 interviewers available were allocated to one such group. Each dwelling in the randomly selected cluster was then visited by the interviewer.

The clusters were not stratified according to distance from the main arterial road as it was known that each dwelling was less than 4 kilometres from the Bomela clinic, a distance considerably shorter than that recommended by Bryant,^(8,33) and accepted generally to be an accessible distance for people to utilise a health facility.

Collection of Data

The information necessary to achieve the objectives of the study was collected by means of a survey based upon household interview. All households in the randomly selected clusters were visited and standardised pre-coded questionnaires were administered by 4 interviewers trained by the Researcher. A household in this study consisted of all people who resided in the same dwelling for the greater portion of the year (more than six months).

Some dwellings contained more than 1 family and some had more than 1 mother from the same family. The person interviewed in this case was the senior sister (mother) or household head if no mother were present.

The study was carried out in June/July/August (1987) as this is the dry winter season and the probability of rain occurring, which would have curtailed the collection of data, was minimal.

Interviewers

In view of the sensitive nature of some of the questions to be asked during the interview e.g. family planning methods, it was decided to utilise women as interviewers. It was also realised that the majority of people interviewed would be women and thus would feel more at ease being interviewed by another woman.

Local community members were selected (4 out of 12 applicants) on the basis of an interview with the researcher. It was felt that local members would be better accepted in the community and would be better motivated, realising the possible potential for improvement of services in the community following analysis of the findings of the study. Interviewers were paid R4-00 for each completed questionnaire/interview. Before the interview by the researcher, prospective candidates were advised that to qualify for the job, a minimum of STD 9 education was required and the researcher's decision would be final with regard to selection for the job. Where candidates satisfied the standard laid down, preference was given to a person who was unemployed or could use the money received for further education/training.

Different interviewers using different interview techniques may result in poor reliability (repeatability) of responses. Appropriate, standardised training, increases the reliability of results.⁽⁹⁾ Interviewers participated in a weekend training course with the Researcher prior to participating in the Pilot Study. The reasons for carrying out the study (aims, objectives) and the details required in the questionnaire were carefully explained and sample Road to Health Cards (RTHCs) and examples of possible family structures were drawn up beforehand by the researcher and studied during the training session.

Standardisation of local terms used to denote e.g. Poliomyelitis, Whooping cough, Pneumonia was achieved (see Annexure B).

Interviewing commenced on 24 June 1987. Each interviewer was responsible for administering 50 questionnaires at a maximum rate of 5 per week. The Researcher reviewed completed questionnaires each week-end and dealt with practical problems encountered in the field.

Households to be interviewed were identified using the aerial photograph and visits to the cluster areas by the interviewer and Researcher were made at week-ends to identify households for interviewing. The identification of households at this stage, on occasions proved difficult as landmarks identified had changed or new houses had been built. However, the clusters of 40 houses generally were identified with accuracy after careful consideration of the photographs.

Structure and Content of the Questionnaires

The structure and content was decided on by the Researcher with the assistance of Dr. K. Naidoo of the Department of Community Health in the light of the listed objectives. Questions were to be understood and answered by people who possibly had little or no education. The questionnaire was in English as this was the second language of the interviewers selected and the Researcher had no

working knowledge of Zulu.

Questions relating to mortality required a recall period of 1 year and for acute illness, 6 months ("Selected conditions") in children under 5 years.

The diseases against which immunisation is available and for which morbidity data was gathered have several terms in the Zulu language. These were standardised and understood by the interviewers (see list/terms - Annexure B). However, it is accepted that inaccuracies of diagnosis will occur e.g. whooping cough (pertussis) is difficult to diagnose clinically as other conditions may resemble this condition and Pneumonia may be mistaken for whooping cough.

The questionnaire required, on average, between 30 and 40 minutes to complete. If the child-minder (over 18 years of age) or mother of the children in the household was not present on the initial visit an arranged time to re-visit was agreed upon between interviewer and householder present. Child minders under the age of 18 years were not accepted for the "proxy" interview and arrangements were then made to interview the mother. Child minders over the age of 18 years were interviewed only if it was ascertained that they were responsible for caring for the child for the greater portion of the days.

If no BCG scar was noted on children under 5 years it was assumed no BCG vaccine had been administered. If no Road to Health Card (RTHC) was available after a second (arranged) visit it was assumed not to be utilised or to be incomplete with regard to growth monitoring and immunisations unless other evidence, such as a clinic record, was produced.

Each completed questionnaire was scrutinised by the Researcher and the interviewer after each 5 visits and errors or problems were dealt with on these occasions, before proceeding to interview the next five households.

LIMITATIONS OF THE STUDY

The random sampling of a population in rural areas where dwellings are scattered (i.e. not concentrated in villages) and where no numbers on houses and no obvious infrastructure or planning exists is difficult.⁽¹⁰⁾ Methods of sampling in rural areas are described in the Literature Survey. A limitation in the sampling technique in this study was the allocation of dwellings to the geographical clusters (40 dwellings per cluster). This led to variations in the geographical size of clusters.

The variability between interviewers that occurs cannot be excluded completely, (and is difficult to measure). Transmission of instructions will result in varying degrees of deterioration in briefing quality.⁽¹¹⁾

It is difficult to assess the reliability of responses to sensitive issues dealt with in the questionnaire e.g. utilisation of traditional healers or breast feeding. Responses may be given which are aimed at satisfying the interviewer.

The assessment of immunisation status based on Road to Health Cards and/or clinic records (patient-carried) is a source of bias. Ideally serology should be used in addition but this was not practical for financial and ethical reasons. The absence of a BCG

scar was assumed in this study to mean that no BCG vaccination had been given. However, at present RTHCs (and clinic records) are the only written record available to health planners, of immunisation coverage. The diagnosis of types of illness e.g. Pneumonia or Whooping cough (Pertussis) is a potential source of error. Pertussis is difficult to diagnose accurately without serological or cultural evidence and this may lead to errors. (See Discussion on Morbidity Prevalence).

The recall period of 6 months for acute morbid events allowed for in the study is much longer than that recommended by some researchers.^(12,13,17) However, "selected conditions" were used (see questionnaire) which aids recall.⁽¹⁷⁾ (See Discussion on Recall in Community Studies) and the "selected conditions" chosen were common illnesses with common Zulu terms known by the mother. In addition the illness had to have appeared serious enough to the mother to qualify for use of the terms listed in Annexure B.

Due to lack of resources (time, money and manpower) re-interviewing of households to check on the reliability of results was not performed. However, studies to check consistency of interview answers by complete re-interviews have shown that influences such as "conditioning effects" may be considerable, and motivating the respondent to give a second interview is difficult.⁽¹⁴⁾ The use of a list of appropriate "Selected conditions" which have commonly used "folk" terms in the population under study helps, it is felt,

to limit bias in illness reporting.⁽¹⁴⁾

Proxy reporting (cf. self-reporting) is a potential source of bias. However, in a Zulu community (e.g. Bomela) it often occurs that more important decisions, such as health care use, are taken by the most powerful members of an extended family. The decisions taken in identifying the etiology and subsequent health care sought are thus frequently the result of "negotiations" within their social network. The type of illness reported in an interview may thus be the result of the above process and the concept of self-reporting being more reliable than proxy reporting may not be correct.⁽¹⁴⁾

Reporting on the utilisation of health service facilities may be subject to two types of response error - recall and "barriers towards reporting on the use of the informal health system".⁽¹⁵⁾ The willingness of people to discuss use of traditional healers depends on public esteem or rejection of these facilities, on the respondents' individual self-esteem, prestige and his/her self-reliance to resist the influence of public (community and "western health workers') opinion. The recall period with regard to health service use would appear to be greater than that for recall of illness (morbidity) episodes. Some studies indicate 6-12 months recall as being acceptable.⁽¹⁶⁾

Exhaustion of interviewers was limited by restricting detail in the questionnaire (30-40 minutes/interview) and restricting the

interviewer to a maximum of 5 interviews per week.

Many errors can be partly avoided by using interviewers from the same ethnic and social group as the respondents.⁽¹⁷⁾ This was one of the selection criteria for the interviewers in this study.

However, this does not eliminate the wide variation in socio-economic status in developing communities which may contribute to response error.

Validation of the interviewers' performance was carried out as part of the Pilot study (8 households). This is a further limitation of this study as it would have been preferable to validate at least 10% of households during the study. However, the Pilot study did not result in structural changes to the questionnaire, and the errors in this phase were of a minor nature (see discussion on Validation). Resources (financial and time) were against a larger validation procedure being carried out.

The size of the sample studied (1 682 people) is too small to allow one to calculate prevalence rates and incidence rates within the community and therefore this has not been done. One is only able to describe the existing numbers (prevalence) in the sample at the time of the cross-sectional study when numbers are small.

LITERATURE SURVEY

HEALTH INTERVIEW SURVEYS IN DEVELOPING AREAS

Health interview surveys are carried out for a number of reasons, including:-

- a. gaining knowledge of people's perceived morbidity,
- b. evaluating their use of different kinds of health services,
- c. identifying their perceived need for health care,
- d. establishing baseline data to assist in health care planning,⁽¹⁹⁾
- e. assessing the current health status of the population,
- f. to contribute to research in the field of chronic diseases.^(20,21)

The most comprehensive Nationally based survey on Population Health Status is the US National Health Survey which is carried out on a regular basis (since 1961), and the most comprehensive International comparative study is the "International Collaborative Study on Health Care" undertaken in 12 regions of seven countries.^(19,22) These surveys have raised methodological questions which have lead to the development of basic rules relevant to the technique of interviewing and improvement of the quality of collected data. India, in 1950, was the first Developing country

to actively use household interview surveys whereas this technique had been used in the USA since the 1920's. However, the specific variables/conditions involved in cross-cultural interviewing were neglected initially.⁽¹⁹⁾ With the increasing demand for more knowledge on peoples' perceived health needs and needs for health services, it is essential that the people themselves be approached for views.⁽²³⁾ This Bomela study, in a small measure, attempted to assess knowledge and utilisation of an existing physically accessible health facility, but did not attempt to determine reasons for the patterns of knowledge and utilisation.

Some of the advantages of health interview surveys include:- relatively quick and easy data collection, relatively low costs (vs. clinical health examinations), use of non-medical interviewers (see Discussion on Interviewers choice) and possible measurement of perceived health needs of a community. Research conducted in some Developed countries on self-perception of an individual's health status shows that self-perception (assessment) is a useful proxy measure for clinically measured health status, that it is not useful for the assessment of the prevalence or incidence of specific diseases and that emotional factors and the social context play important roles. Cross-cultural research on this subject is however still lacking.^(19, 24)

This interview survey did not aim to describe the incidence and prevalence rates of the conditions listed in the questionnaire for

the entire community. One of the main objectives was to determine if the present method of recording certain variables regarding children i.e. Road to Health Chart was being utilised - because it is important that records be kept for the evaluation of performance of a service and it's personnel and the evaluation of results achieved. However, using "selected" conditions as one way of assessing the socio-economic and immunisation status of the community was for practical reasons (time, manpower, cost) selected, in favour of clinical examination (e.g. physical and serological surveys).

"Accurate reporting occurs when the illness in question is salient, and social and psychological barriers to reporting are absent" ⁽²⁵⁾. Surveys conducted in the USA have shown that there was a considerable degree of response error in the reporting of those illnesses which involved no disability or medical consultation and that the more involved the respondent's contact with the health service was e.g. hospital admission, the more accurate the reporting.⁽²⁶⁾ This study examined morbidity (illness) in children according to a pre-determined set of signs/symptoms known to the community and used by them. However, bias is not excluded and one accepts the potential for inaccurate reporting which occurred. However it should be borne in mind that one of the objectives of the study was to assess the presence or absence of, and the completeness of the recording of the Road to Health Charts as a measure of:

- a. records kept on childrens' health status in the community and;
- b. awareness in the community of the importance of these records.

It is impractical, at present, to assess immune status of all communities using clinical (examination and serological) diagnosis. (See Discussion later on Road to Health Charts).

The Recall period used in this study would appear to be long in relation to that generally recommended.^(13,27) In the course of the interview in this study there were 3 occasions when the respondents were required to recall events related to health (illness). If one follows the "salient principle" (see above), the recall period for an illness in a child by the mother/minder, of 6 months, may not be excessive. The illness episodes alluded to in the questionnaire were not minor ailments and definite signs/symptoms had to be present to qualify for a record to be made. (See Annexure B). The recall period for a mother for nutrition during a pregnancy in the previous year may have influenced the accuracy but an assumption made in designing the questionnaire was that dietary factors/customs do not alter excessively due to the occurrence of pregnancy. The use of a list of "selected conditions" (see Annexure B) in this study would help counteract the negative effects of a long recall period.⁽²⁸⁾ "Selected conditions" remind respondents of even minor complaints and do not depend on the respondent's ability to verbalise his opinion and overcomes the problem of variation in definition of illness - an important point in cross-cultural research. The construction of the list of

"selected conditions" was based on illnesses preventable through immunisation and common known causes of morbidity in developing countries together with a knowledge of the community's symptoms descriptions (see Annexure B).

Proxy reporting has been shown, in general, to be less accurate than self-reporting.⁽²⁹⁾ To obtain information on child morbidity, mother/minder must be interviewed. However, it is a source of error so far as information on disease prevalence is required⁽¹⁰⁾. Where communities follow a "paternalistic"-type society and families decide on an individual's problems, it has been demonstrated that family interviews may reflect true family attitudes and perception more accurately.⁽³⁰⁾ Personal experience, working in the area would suggest that advice on certain illnesses must first be obtained from the family head. Thus in this community a family interview would have reflected more accurately, illness perceptions than an individual interview survey method.

Many errors in health interview surveys can be partially avoided by using interviewers from the community being studied. Members of the community should have the interests of their community at heart and motivation would therefore be greater than for people coming from outside.⁽³¹⁾ This assumption was the basis for the selection of the interviewers in this study - who also benefited in the form of cash remuneration. However, it should be borne in mind that people outside the community may be more successful at

dealing with sensitive community/individual issues.⁽¹⁹⁾

Validation of initial responses to a health interview where resources are restricted is a problem. Re-interviews have been used as a method of testing reliability.⁽³¹⁾ However, several studies have suggested that re-interviewing for consistency checks on questionnaire results have shown differences in results obtained and a drop in morbidity reporting.⁽³²⁾ Practical restrictions prevented re-interviews being carried out in this study. See Discussion on Sampling in Rural Areas for further views on methods of interviewing not utilised in this study.

SAMPLING IN RURAL AREAS

To estimate immunisation coverage in developing countries the Expanded Programme on Immunisation (EPI) has used, in several areas, a simplified cluster sampling method.⁽⁴⁶⁾ The introduction by the WHO of the EPI, resulted from a realisation that immunisation could, cost-effectively, greatly reduce morbidity and mortality from the diseases immunised against. Yet in 1974 it was estimated that no developing country had achieved even 5% coverage for the six target diseases of the EPI.⁽⁴⁷⁾ In order to assess the effectiveness or otherwise of a campaign, such as EPI, it is self evident that it is necessary to evaluate the performance. One of the methods of evaluation employed is to assess the vaccination status of children in selected communities. For this assessment to be made sampling would of necessity have to be performed. The EPI recommended cluster sampling technique has been used extensively world-wide. The method (in broad outline) involves:

- a. identifying the geographical areas of interest,
- b. identifying the age-groups of interest,
- c. random selection of 30 clusters from within the geographical area for which the results are desired,
- d. random selection of a starting point ("household") within each cluster and,
- e. selection of 7 individuals of the appropriate age from within each of the 30 clusters.

Selection commences in the starting household and then continues to the next nearest household until a total of 7 individuals is obtained. All individuals of the appropriate age living in the last household falling into the sample are included, even if this means including 8-10 individuals in the cluster. This gives a sample number of at least 210.⁽⁴⁶⁾ The EPI method places each individual into one of 2 categories - immunised or not immunised.

This method was not used in this study for 2 reasons:-

- a. The study aimed at obtaining information on environmental, economic status and general age - sex structure of the whole community as well as immunisation status of children and,
- b. The aerial photograph taken of the area 9 months prior to the study gave one the opportunity of identifying households within clusters and interviewing each household within a defined cluster.

Another method suggested by Dr. S. Reinach (Medical Research Council - Biostatistician, Personal communication) was to utilise School pupils in the area as a means of identifying households to be interviewed. However, the area under study has 2 primary schools and cross-boundary flow into adjoining areas (of pupils) was considered to be high (personal communication with the Headmasters) and this may have led to bias and difficulties in selecting households. In addition it was felt by nursing staff and

school teachers in the area that a fairly large number of children from the Bomela community attend schools in other Magisterial districts making random selection of Bomela households difficult as these children would have been excluded from selection, and that a high percentage of children do not attend school, thus potentially excluding these households from the study.

The community studied was not grouped in village-type clusters but consisted, as is customary amongst the Zulu, of widely scattered "kraals" of 3-4 households. This leads to practical difficulties in defining clusters and in visiting for interviews, as large distances had to be covered by the interviewers during the course of the study.

For the method of sampling used in this study, the area was easily identified using a recent aerial photograph of the area and individual houses were selected according to the method described.

Random sample surveys in rural areas present problems to researchers and no method is without difficulties. Houses are not numbered, no formal streets or roads exist and other means of communication are often non-existent. In addition vital statistics such as birth records are often unreliable for various factors as shown in the study later.

PRIMARY HEALTH CARE

"Primary Health Care (PHC) is essential health care made universally accessible to individuals and families in the community by means acceptable to them, through their full participation and at a cost that the community and country can afford. It forms an integral part both of the country's health system of which it is the nucleus and of the overall social and economic development of the community. It is the first level of contact of individuals, the family and community with the national health system, bringing health care as close as possible to where people live and work, and constitutes the first element of a continuing health care process. PHC addresses the main health problems in the community, providing promotive, preventive, curative and rehabilitative services accordingly. It includes at least: education concerning prevailing health problems and the methods of preventing and controlling them; promotion of food supply and proper nutrition; an adequate supply of safe water and basic sanitation; maternal and child health care, including family planning; immunisation against the major infectious diseases; prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries; and provision of essential drugs. PHC involves in addition to the health sector, all related sectors and aspects of national and community development, in particular agriculture, food, industry, education, housing, public works, communications and other sectors; and demands the co-ordinated efforts of all those sectors. It requires and

promotes through appropriate education the ability of communities to participate".⁽³⁹⁾

Disenchantment with existing health care is widespread. Available technology has brought little relief to millions of poverty stricken individuals throughout the world. Health care resources are allocated mainly to sophisticated medical institutions in urban areas, leaving rural inhabitants, often, deprived of access to adequate health facilities.⁽⁴⁰⁾ PHC is a practical approach (vs. high technology) to making essential health care universally accessible to individuals and families. Its form is largely determined by social goals attained by social means such as greater community participation and acceptance of greater responsibility for health by them.⁽⁴¹⁾ However, the prospects for increased participation by communities in decisions regarding their own health depends not only on appropriate legislation, social action and growth in community skills but also on overcoming such large obstacles as:- entrenched medical dominance, antagonistic bureaucrats and the political economy of health.⁽⁴²⁾

In underdeveloped countries more than 70% of the population suffers from infectious and communicable diseases. These diseases are transmitted with the help of poor quality and quantity water, inadequate sanitation, bad housing etc. Education and nutrition also affect the vulnerability of the individual. All these factors

are themselves dependent on income. A redistribution of income for all - and an increase in the absolute income for some are necessary to cure the ills of society.⁽⁴³⁾ In the meantime specific PHC (SPHC) - through GOBI-FFF may help alleviate some of the acute problems of communities. This study attempted in a small way to establish current status of basic living conditions and to establish a baseline to monitor future change.

GOBI-FFF - AIMING AT ACCESS TO PRIMARY HEALTH CARE FOR ALLCHILDREN

UNICEF was established in 1946 as part of a world-wide plan to alleviate the consequences of a major international disaster - WORLD WAR II - and was a statement by the International community that the world's children ought to be protected in times of emergency and disaster. Acceptance of this ethic is illustrated by the massive response to the plight of the children of Africa.⁽³⁴⁾ However, a silent emergency of considerable magnitude still exists and needs urgent attention. More than 14 million children die every year - mostly from gastro-enteritis, pneumonia, tetanus, measles and malnutrition. It is noteworthy that "More children died in India and Pakistan than in all 46 nations of Africa put together" (1985).⁽³⁴⁾ This emergency is every bit as tragic as the disastrous casualties of war and famine which daily make headlines in the mass media. Today, improvements in knowledge and communications and technology can prevent many of the deaths listed above. At present it is estimated that 40 000 children under 5 years of age die each day and millions more are malnourished, blinded, brain-damaged and disabled by these preventable disorders.⁽³⁴⁾ Through a well planned GOBI-FFF programme this mortality and morbidity is preventable. The knowledge and means of considerably altering this circumstance is available. If public

and political opinion were to view the effects of these preventable diseases as an intolerable evil, the implementation of GOBI-FFF could play a major role in this regard.

GOBI-FFF is a form of what is now termed Selective Primary Health Care (SPHC).⁽³⁵⁾ An argument is put forward that UNICEF is mistaken in believing that its present emphasis on SPHC (GOBI-FFF) is a precursor of comprehensive primary health care (CPHC) as envisaged at ALMA-ATA (1978).⁽³⁶⁾ It is argued that SPHC (GOBI) is likely to undermine the social basis for comprehensive care. UNICEF, in trying to minimise costs and maximise impact on child mortality, would appear to be undermining the development of grass roots organisation among parents and primary health care workers (PHCW). The conclusion drawn by one author is that UNICEF's GOBI-FFF "should either be abandoned or integrated into comprehensive PCH (CPHC) programmes that put parents and local workers in control and that emphasize continuing political struggle for health rights."⁽³⁵⁾ Another argument states that "CPHC (ALMA-ATA) is concerned with the developmental process by which people improve both their lives and life-styles. Good health is a key factor to this process. We see SPHC (GOBI-FFF) as being concerned with medical interventions aimed at improving the health status of the most individuals at the lowest cost".⁽³⁷⁾ The implications from this statement being that those who favour SPHC (GOBI-FFF) believe that those who provide the interventions (e.g. health workers) can control the outcome, and those who favour CPHC (ALMA-ATA) believe that the control of the

outcome of medical interventions lies in the hands of those who use or should be able to use the interventions and yet have little control as social, political and economic conditions of individuals and population's play a major role in outcomes to which health workers only contribute but do not define. In other words is GOBI-FFF merely a short term solution via technological means to alleviate a problem which really can only be realistically tackled and overcome by long range strategies and policy reviews of governments and solving basic problems among the people rather than delivering technology?⁽³⁷⁾ UNICEF counters this argument by stating, "If the present momentum can be sustained, and if more nations begin mobilising to put today's low-cost child health breakthroughs at the disposal of parents the lives of some 5 million children a year can be saved by 1990 If it can be achieved, the promotion of the most powerful methods of child health protection could also serve as a "thin end of the wedge" for the more CPHC services (ALMA-ATA) to which every child has a right. For in empowering people with information and in deploying essential supplies and trained community health workers child survival initiatives can begin building practical PHC from the ground up."⁽³⁴⁾

Both arguments have their merits, however, evidence would suggest that the cause of PHC can be significantly advanced through the involvement of health workers and this can be a major boost for national development, to bring health technology within reach of

the majority, and through the involvement of the public in knowing more and doing more about their own and their families health ⁽³⁸⁾. Immunisation programmes (and GOBI-FFF generally) can serve as an end and a means of achieving PHC, achieving both immediate protection against specific diseases and the involvement of whole societies in longer-term health promotion. **SHOULD IMMUNISATION AWAIT ECONOMIC DEVELOPMENT AND THE COMING OF TAPPED WATER, GOOD SANITATION, ADEQUATE RECREATION FACILITIES AND ACCESSIBLE CLINICS TO A COMMUNITY?** Surely a sentence of death, if accepted, for millions of today's children and future children, because CPHC depends on such political, economic, social and other factors which local communities often are powerless to manipulate. Development's greatest failures (in developing countries) have often arisen due to disregarding the potential of the individual or of the community to change existing conditions. Large-scale projects and plans have been drawn up and commenced, and often failed to help the ordinary person in the rural communities, because they have failed to make that essential element - communication (contact) - a factor in the project. The answer to development accompanied by the benefits associated with this may thus lie in utilising individual and local community participation. GOBI-FFF (SPHC) is one method of achieving this and thus the argument of SPHC (GOBI-FFF) vs. CPHC (ALMA-ATA) should not detract from the immediate potential for improving the quality of life of the frequently neglected rural (and peri-urban) community members.

THE IMPORTANCE OF DEMOGRAPHY IN HEALTH PRACTICE

One of the functions of Demography is to estimate the size of populations and a second function is to determine the sex and age composition within that population. To enable these functions to take place extensive, accurate and current statistics must be available. The collection of these statistics is expensive in terms of resources (money, manpower, time and materials) but the importance of the relevant information should not be underestimated by health authorities. One of the aims of this study was to gather basic demographic indices (population numbers, age and sex structure and dependency ratio) for the local Bomela area based upon a random sample of the area. A census is the main source of demographic statistics in many countries (including the RSA). The last census for this country was carried out in 1985. One of the major limitations of this census was the estimated "under count" of the Black population of about 25% (RSA Census - 1985). However, census figures on a national basis are of little value to health workers concerned with small local communities within the total population.

The structure (sex and age) of a population is one of the basic fundamental aspects of demography. Diseases are unequally distributed within a population with respect to sex and age. This unequal distribution also manifests in different spatial

distributions.⁽⁴⁴⁾ Thus a knowledge of the structure of local communities for local health workers and planners is important in efficient allocation of resources e.g. vaccines and schools in "young" populations as opposed to rehabilitation/geriatric assessment centres in "older" populations. This study would indicate the predominance of a young sector within the community. "Particular sub-groups of the population are more susceptible to certain types of diseases than other groups. Further, it is essential to take spatial distribution and accessibility of population groups into account in order to arrive at the best possible location of facilities for the treatment of patients"⁽⁴⁵⁾

Results from study indicated that 15,3% of the population were under 6 years of age, of whom 49% were males (TABLE 1, FIGURE 1), and 26% of the population were between the ages of 5-15 years.

The age composition of a population determines to a large extent, the activities - social and economic - of that community as well as the potential growth of the population. The average family size among Coloureds and Blacks is 5,0 and 7,5 respectively, with a high dependency ratio. "A high percentage of children can limit economic development, particularly in a population already caught up in a cycle of poverty, illiteracy, unemployment and a low standard of living".⁽⁴⁵⁾ The results of this study showed that 41% of the population were between the ages of 0-15 years.

SOCIO-ECONOMIC PROFILE

In this study educational levels, employment/unemployment and disability (in terms of those receiving Disability Grants) was studied. Whites and Asians have a high literacy rate and relatively high level of education, in contrast to Coloureds and Blacks in RSA.⁽⁴⁵⁾ On a National level, 44% of Whites have achieved post STD 10 education levels as compared with 14% Asians, 4% Coloureds and 1.5% Blacks (1% attained Matric in the Bomela community (TABLE 3). However, education statistics for the 1980's show increasing numbers of Black pupils and students at school and university.⁽⁴⁵⁾ The results of this study show that only 22% of the Blacks in Bomela community had achieved more than STD 7 education. Ability to read a daily newspaper is attained in Std. 8 or 9 (personal communication with local Headmaster). If a minimum standard of living is to be achieved for all citizens, expansion and improvement of services such as increased employment opportunity, health care, water supply and basic education must be given their due priority. Basic education programme contents and methods - aimed at primary education, literacy and non-formal education programmes for youth and adults should be aimed at communities' needs and priorities. Re-orientation of existing educational activities should involve distance education and the use of communications media.⁽⁴⁸⁾ (See Discussion on Female Education later). Practical, relevant primary education will only be

acceptable to communities if it is perceived by them as being fair and equitable and affording possible opportunities for further education. This will mean community participation, in the true sense of the word i.e. planning, implementing and managing. This would of necessity involve decentralizing educational activities.

"Government policies and external economic forces have combined to increase rural poverty in most African countries".⁽⁴⁸⁾ This would include RSA -(personal addition). Economic sanctions have not helped the atrocious unemployment statistics of this country. (True figures unknown) but this study shows unemployment amongst the employable (16-44 years) to be at 46% for the Bomela community, (30% of males and 58% of females) (TABLE 2, FIGURE 3).

The severe economic crisis calls for action. Deterioration can be expected before improvement in the situation takes place. Thus a strategy should be sought and implemented which takes account of:

- a. the human potential,
- b. correcting the balance of payments situation with the "long term" in mind and,
- c. strengthening long-term development.

This will involve education, literacy programmes, increasing exports/decreasing imports, developing human resources by achieving universal access to equitable education and health facilities, and encouraging agricultural production for local consumption and

export markets.⁽⁴⁸⁾ Clearly present Government Policy (Apartheid) and external pressure in the form of economic sanctions together with allocation of vast amounts of our country's wealth to the ARMS industry (for whatever reason) impedes severely, the potential to improve the socio-economic status of all our communities - including the one studied here (Bomela).

GROWTH MONITORING

Recent advances in knowledge make it possible for parents and communities to be effective as health workers and so bring about an improvement in their children's quantity and quality of life. The increased acceptance of the PHC principle and the growth of communications capabilities world-wide has enabled this advance in knowledge to be presented to rural and less developed communities and to support them as they would try to use the knowledge gained. Various techniques (methods to promote child survival will be used according to local circumstances), but in general the GOBI-FFF techniques (see Definitions) are relevant to most nations, and at a relatively low cost, can prevent much morbidity and mortality in children. Used together, GOBI-FFF methods, can act against the devastation wrought by infection and malnutrition (which themselves act synergistically) and so help combat the major problems of child survival. Growth monitoring is one of the techniques of GOBI-FFF.

In common with other health programmes, emphasis in nutrition has shifted from treating established malnutrition (costly and difficult) to its prevention by the promotion of health growth.

In Developed countries, most children are weighed periodically during the first 3 years of life. "If the child is growing the child is well", is a favourite comment of the Paediatrician. On

the other hand if the child is not growing something is wrong. A child's growth will slow down months before there are obvious clinical signs of malnutrition. UNICEF believes that "growth monitoring is probably the most essential step towards the eradication of child malnutrition in our times", and "In addition to its intrinsic merits, growth monitoring also offers a way of uniting the low cost action (GOBI-FFF) into a synergistic whole which could help to bring about a revolution in survival and child development and growth every child born in the developing world should also be regularly weighed and its growth monitored and promoted, up to the age of 36 months, by the child's own parents assisted by a community health worker who is trained and supported by the professional health services".⁽⁴⁹⁾

Regular weighing and accurate recording of the results on a growth chart (RTHC) may identify children at risk of malnutrition (underlining personal). This monitoring combined with advice and help from health workers can enable parents to protect the development of their children.⁽⁵⁰⁾

Poor growth, whether as a result of infection, malnutrition, or other cause, and whether evident in individuals or particular community groups, needs to be detected in order that corrective action can be taken. Regular weighing has been shown to benefit child health. The growth chart offers a simple and inexpensive means of recording this weight. A graphic display - being visual -

permits the mother and the family rapid detection of deviations from the normal pattern.⁽⁵¹⁾ "The concept of this home-based medical record for younger children (RTHC) incorporating a system for monitoring growth, was popularised by Professor David Morley after his experience in the Nigerian Village of Ilesha".⁽⁵²⁾ RTHCs have been used in RSA since 1973 and over 40 different designs in RSA alone, are available. Obviously this large number of different designs - two or three on occasions being issued to the same mother for the same child as a result of the fragmentation/duplication within the health service delivery system of RSA (personal experience) - will lead to confusion among parents and health workers alike.⁽⁵¹⁾ Confusion will inevitably lead to both misuse and under-utilisation of the RTHC. Poor completion, lack of knowledge on interpreting the recorded measurements, limited accessibility, poor results in large-scale programmes and incorrect use of scales have been discussed.⁽⁵³⁾ The RTHC can be a very valuable record if understood by mother and health workers and subsequently used correctly. Being associated with immunisation status and minor ailments it can be considered as part of the primary health care thus preventing immunisation being viewed as an end in itself. The problem of the multiple designs of RTHCs in RSA and the confusion this creates should be addressed and general use of one card will allow health workers and parents alike to become familiar with the concept.⁽⁵¹⁾

In a study done in RSA, it was noted that 55% of children attending

were accompanied by a RTHC (similar to the results of this study) and 32% of cases were not requested to produce the RTHC to the health worker. It was also noted that "no-one had explained it's purpose to approximately half the parents or care-takers".⁽⁵⁴⁾ Personal experience in "continuing" education of professional nurses at peripheral clinics would indicate that the purpose of a RTHC is not explained adequately to nurses during their training and as a result they are not motivated to utilise them correctly.

Three main types of anthropometric measure are commonly used as indicators of size: length or height, weight, and various body circumferences. They all have advantages and disadvantages depending on the use to be made of the measurements. The relative change of weight with age is more rapid than that of height and is much more sensitive to any deterioration or improvement in the health of the child. Making the measurement is easy and a high level of accuracy is possible if staff are properly trained and scales are accurate and appropriate. It is for these reasons that weight for age is the measure usually employed in growth monitoring. One disadvantage is that it is affected by abnormalities of body composition e.g. oedema in Kwashiorkor and this may cause confusion in interpretation. However, it must be borne in mind that RTHCs are primarily used to detect early signs of malnutrition/growth retardation and thus if used appropriately the problem of abnormal body composition would not be major. Thus RTHC with growth monitoring should be seen as a preventive

"diagnostic tool" against malnutrition manifesting clinically.

The suitability of the data used to develop RTHCs in USA from the National Centre for Health Statistics (NCHS) - has been questioned. Is it valid to compare the growth of Asian or African children with that of American children? However, it has been found that children living under optimal environmental conditions in many different developing countries have growth patterns very closely resembling those NCHS data . It is believed that any weight differences between children from different countries that might be due to race would be relatively small in comparison with the large differences actually observed due to environmental factors e.g. Malnutrition, infectious diseases and diet.⁽⁵⁵⁾

The RTHC should be printed on material strong enough to withstand at least 3 years of use. The chart is primarily a home-based record and therefore a plastic covering should, ideally, be supplied in which it can be kept. Personal experience, at peripheral clinics, would suggest that the 3 year life span is difficult to achieve and most do not come accompanied by plastic covers.

As the monitoring in the RTHC is dependent on weighing, it is important that weighing should be as accurate as possible. The type of scale selected should be robust, accurate and easily standardised and maintained. It must be checked regularly by the

personnel at the clinics. This poses administrative and educational problems - but it is important that the scales and method of weighing are dependable. A system for procurement, distribution, repair and replacement of scales is needed. The KwaZulu Government is responsible for this at Bomela clinic.

Regular weighing of the child also allows regular contact of the mother/child minder with a member of a health team. Frequent help and reassurance are important in enabling parents to put new knowledge into practise and thus this regular contact with a trained person could be a most important channel for informing and supporting parent's/child-minders in the use of the low-cost technology which the GOBI-FFF programme offers. In other words, growth monitoring can also promote knowledge about Oral Rehydration Therapy (ORT), immunisation, Breast feeding etc...⁽⁴⁹⁾ Another potentially important aspect of Growth monitoring (and indeed GOBI) is that it helps to shift the emphasis for child care responsibility from Doctors/Nurses to parents and community members i.e. genuine PHC. The mother becomes the focal point of child health in the community with health workers playing a supporting role - perhaps this aspect would be difficult for health care workers to accept. Ideally growth monitoring would, therefore, be organised by mothers for mothers at a convenient place and time, supported by a health service. This however is only an ideal in most areas of the world - certainly in the Bomela community studied, at this stage.

Two common problems in growth monitoring (RTHC) programmes are:

- a. confusion about the purpose of growth monitoring and,
- b. the exclusion of mothers from active participation in the process.

The first problem arises because growth charts are used for 2 functions:

- i. identifying undernourished children and therefore those who are in need of food supplementation and nutritional rehabilitation and;
- ii. the very different function of growth promotion, aimed at those children under 2 years of age and attempting, using the growth chart, to prevent growth faltering in the first place, i.e. true prevention.

Another problem is the tendency to compare children attending growth monitoring "sessions". The aim of growth monitoring an individual child is to ensure that he/she maintains growth along his/her individual growth curve, as children come in many sizes and comparison with other children can discourage mothers whose child is following his/her normal growth curve.

A third major problem is that too many programmes are centred on the Doctor/Nurse/peripheral clinic structure where the child is weighed, the line on the chart updated, filed and few words may or

may not be said to the mother (personal experience). If the growth chart is not used as a tool for the mother (i.e. she must understand the growth chart) it may well be useless.⁽⁴⁹⁾ After all, it is the mother who daily is responsible for the growth of the child and prevention of illness. Mothers/child-minders must not be presumed to be ignorant and unable to understand the RTHC concept. It is usually the fault of the health worker who won't teach them or bother to spend the necessary time explaining the concepts to individual mothers. The cultural barriers to approaching the mothers are often immense, but must be tackled in a sensitive manner if we as health workers hope to gain the co-operation and participation of parents in the GOBI-FFF programme.

A weakness of this study, was that only the presence and completeness of the RTHCs was measured. This does not give any indication as to the level of understanding of the process by the parents/child-minders and also fails to show the level of participation in the programme by the community, (not forgetting nurses).

The percentage present (55%) and complete in those who possessed a RTHC (42%) and the fact that in total, only 23% of children had a RTHC up to date is a cause for concern and should act as a stimulus to educate health workers and community members in Bomela as to their value.

When considering the use of growth monitoring perhaps it would be wise to consider problem areas which have been identified:-

- a. lack of commitment of senior health personnel to growth monitoring,
- b. lack of knowledge and understanding of the functions of growth monitoring by health workers,
- c. lack of knowledge and lack of participation by mothers/child-minders in the programmes and
- d. inappropriate design and lack of standardisation of equipment (scales, RTHCs).⁽⁴⁹⁾

Growth monitoring is perhaps the most difficult of the GOBI-FFF strategies to carry out. It, in itself, has received little in the way of research, funding and publicity, perhaps as it is not conceived as being a technology? Potentially it's impact could be great. However, no research as yet has proved that it is effective, even under ideal conditions, as a PHC strategy and a screening procedure to prevent morbidity and mortality in children.⁽⁷²⁾

ORAL REHYDRATION THERAPY/GASTROENTERITIS

"Diarrhoeal disease is the greatest single killer of children in the developing world - and often the chief cause of childhood malnutrition. The prevention of diarrhoea depends upon improvements in water supply, sanitation and hygiene. But in the meantime, the majority of deaths from diarrhoeal dehydration can be cheaply prevented by oral rehydration therapy (ORT)."⁽⁵⁶⁾

"The discovery that sodium transport and glucose transport are coupled in the small intestine so that glucose accelerates absorption of solute and water was potentially the most important medical advance this century".⁽⁵⁷⁾ Although ORT is in itself a simple process it has saved many lives and its potential is enormous when "seen in the light of the prevalence of the diarrhoea problem throughout the world. The greatest value of ORT is that it can be readily available in virtually any home, even in disadvantaged communities".⁽⁵⁸⁾

A formula for ORT has been standardised by the WHO. In most developing countries this oral rehydration solution (ORS) is mass produced in foil sachets. This ORS ("Sorol") is available in the clinic serving the Bomela community studied. However, ORS can be fairly easily made in the home where clean drinking water, sugar and salt are required. (Clean drinking water may be the biggest

problem in poor rural and peri-urban communities).⁽⁵⁸⁾

Immunisation and ORT as tools in public health are probably the lowest-cost public health weapons and are capable (between them) "of overcoming a synergistic group of illnesses which are responsible for more than half of all child deaths and more than half of all child malnutrition in the world today. Statistically the biggest single killer of the world's children is still the dehydration caused by diarrhoea"⁽⁵⁹⁾. In the early 1980's, the technique of ORT was almost unknown amongst the general health worker population but UNICEF estimates that by 1986, 12% of families were using ORT compared with 9,5% estimated in this study for the Bomela community (FIGURE 18) . If all parents were to use ORT it is believed that the annual death toll of children could be reduced by "more than 3 million".⁽⁵⁹⁾

A common reaction of parents in many different cultures is to withhold food and fluids during a diarrhoeal episode. In fact, amongst some communities (e.g. Zulus) some families administer enemas during a diarrhoea episode (personal communication with staff at clinics). Thus a challenge immediately presents itself of placing the scientific rationale for ORT within the knowledge of communities (including traditional healers) so that it becomes culturally acceptable.

Research would indicate that a poor nutritional state has a definite relationship with increased duration of diarrhoea. "If

poor nutritional status predisposes to more severe diarrhoea then it would be expected that poor nutritional status would predispose to diarrhoea mortality." It was shown in a study that children below 65% weight-for-age had a diarrhoea mortality rate 3,8 times greater than children over 65% of weight for age.⁽⁶⁰⁾ The causes of diarrhoea will not be dealt with in this report, suffice it to say that the many pathogens which give rise to diarrhoea are more prevalent and more harmful in an unhygienic environment. Measles has been linked with between 6 and 25% of diarrhoea deaths and measles immunisation can thus play an important role in decreasing mortality due to diarrhoea.

In 1981 about 50 million sachets of ORS were produced compared with the rise to over 300 million in 1986. Over 40 nations now mass produce ORS sachets.⁽⁶¹⁾ It is estimated that "more than 95% of the developing world's population now live in countries that have diarrhoeal diseases control programmes".⁽⁷³⁾ KwaZulu - the area in which the community is situated - has a policy on diarrhoeal disease control and distributes, freely, packets of "Sorol" (ORS).

Research on ORS (and ORT) reports that using cooked rice powder instead of glucose reduces duration of diarrhoea by approximately 30% and stool volume by about 40%.^(59,61) However, the "big" challenge remains the finding of a satisfactory way of enabling millions of families all over the world to obtain knowledge, accept the knowledge and to practise ORT. Where cultural beliefs need

revising the role of appropriate health education will of necessity occupy an important part.

A study in Egypt on how parents came to know about ORT showed that approximately 30% of Egyptian parents (who know of ORT) heard of ORT via the radio and 80% learned about it through the Television commercials. Curricula in Medical Schools and teaching hospitals trained Doctors, Nurses and Pharmacists in making and demonstrating the use of ORT. This basically involved retraining health workers! Now in Egypt sachets of ORS are available in all government clinics and private pharmacies.⁽⁵⁹⁾ However, Egypt differs from many developing nations, in that almost 90% of the population have access to a television and almost 100% live within reasonable distance of health centres staffed by qualified doctors (UNICEF). However, the principle remains that mass media should be used wherever and whenever possible to communicate the "message" of ORT. Radio Zulu and local newspapers could be more utilised here as should SABC TV 2/3.

A second principle must be that of educating health personnel into gaining knowledge about and accepting ORT. This could prove to be the biggest obstacle to universal ORT. On theoretical grounds, ORT should be more widely available than immunisation. Immunisation requires vaccines, "cold-chains" technology and trained vaccinators whereas ORT requires availability of ORS and motivated parents who have knowledge about the ORT. Perhaps the reason that ORT remains

relatively under-used, is that health workers (including Doctors) are generally unaware or do not accept the importance and potential of ORT whilst being more aware of the importance of immunisation. Many medical practitioners continue to prescribe anti-diarrhoeal drugs which are known to be useless or even harmful in children. "In other words, doctors and nurses are today still prescribing the wrong treatment for one of the world's most common illnesses".⁽⁵⁹⁾

It is interesting to note that a programme to train medical assistants and village administrators in the correct use of ORS which was instituted in Tonga (1978-1983), succeeded in reducing the number of deaths due to diarrhoea and also reduced the degree of dehydration of children admitted to hospital for diarrhoeal disease.⁽⁶⁹⁾ In this study it was shown that instruction in the use of ORS/ORT was most effectively given by non-medical staff, to groups of mothers rather than a doctor or nurse in their short hospital encounter.

At the Second International Conference on Oral Rehydration Therapy, held in Washington DC in 1985, the conference recognised the following key elements that have characterised successful ORT programmes:-

- a. a strong political commitment resulting in a national plan of operation with sufficient financial resources and integrated into a wider health programme.
- b. a clear strategy for the delivery and use of ORT in the home

and in health facilities including recommendations for feeding during diarrhoea. This makes task definition for mothers and health workers alike, easier.

- c. ensuring the availability of adequate supplies of ORS packets, and training pharmacists and traditional healers in the proper use of ORT. The design of a standardised ORS packet for National use should suit the size of a nationally available container (e.g. 1 Litre "Coke" bottles in RSA). National Authorities must have the courage to stop the promotion and use of anti-diarrhoeal drugs and useless antibiotics in childhood diarrhoea.
- d. special attention to information activities orientated towards the needs of consumers, not just providers.
- e. recognising the importance of supervision, including the regular monitoring of both quantity and quality of programme activities, because a mere awareness of ORT without a genuine opportunity to transform that awareness into effective treatment will accomplish little.
- f. a plan for programme evaluation from the outset because, without evaluation, assessment of the impact of the ORT programme is impossible.⁽⁶¹⁾

Another aspect concluded at the conference advised that training on ORT at all levels must include sufficient first-hand experience to give workers confidence that they can administer ORT and apply it even when it has not been well accepted. Experience shows that

if mothers are to use ORS/ORT correctly they must receive repeated encouragement and training.⁽⁷³⁾

An appeal at the Conference (above) was also made to look beyond ORT in respect of the proportion of diarrhoea - associated deaths (about 1/3) that are due to shigellosis and persistent diarrhoea which cannot be prevented through ORT alone. Thus prevention must be given more attention. Breast-feeding (see Discussion later), proper weaning, safe water, good sanitation, good personal and domestic hygiene and measles immunisation are cost-effective preventive measures to further decrease the morbidity and mortality of diarrhoea in children.

It is difficult to practise safe water and good hygiene where water access and availability is restricted however, and comprehensive PHC will play a role here.

BREAST FEEDING

It has been shown that Breast feeding enhances survival during the first year of life.^(62,63) It is one of the basic UNICEF strategies for the protection of children through PHC. A study carried out in Bangladesh,⁽⁶⁴⁾ also showed "a strong association between breast-feeding and survival in children of 18-36 months of age and suggested that about one third of deaths in this age range may be attributed to the absence of breast-feeding. Nevertheless, the association cannot be assumed to be causal until possible sources of bias have carefully been considered". The above study also demonstrated a higher frequency and greater severity of bloody diarrhoea in non-breast-fed children. The risk of dying was significantly increased, in the absence of breast-feeding, only in children who were assessed as being severely malnourished.⁽⁶⁴⁾

Although human milk may not always be considered best for preterm infants in developed countries, it was found to be life saving in under-privileged areas of the Third World.⁽⁷¹⁾

"Breast-milk is the ideal infant food, being more nutritious, more hygienic and more economical than any breast-milk substitute. Breast-milk also provides a degree of immunity to infectious diseases as well as having a contraceptive effect through inhibiting ovulation".⁽⁶⁵⁾ Other advantages which have been claimed

for breast-feeding range from closes emotional ties between mother and child (bonding) to greater intellectual ability in later life for the breast-fed child.⁽⁶⁶⁾

However, it is of interest to note, in passing, that anthropological rating, on mothers breast-feeding in 186 non-industrialised societies, demonstrated "no increase:- in maternal affection in societies which fostered mother-infant body contact, in paternal involvement when fathers were allowed at childbirth, or in breast-feeding duration in those which permitted early nursing".⁽⁷⁰⁾

The results of this study would indicate that 81% of women Breast-feed until the child is at least 4 months old. (Weaning in this study meant complete withdrawal of breast-milk). Compare these results with prevalence studies performed in Pretoria (White Mothers) where 18% were exclusively breast-feeding at 3 months, KwaMashu where 25% of urban (Blacks) were breast-feeding at 3 months and 63% of rural (Black) clinic attenders were breast-feeding.⁽⁶⁷⁾

It would seem that, world-wide, breast-feeding is enjoying more favour. The majority of women on leaving "delivery units" are breast-feeding their infants. However, the prevalence varies according to income patterns and level of "western" development of the society.⁽⁶⁵⁾ It seems evident that campaigns promoting breast-

feeding should not be directed at women alone. Education, support and information on the correct Management of lactation should be provided by health workers and voluntary lay organisations e.g. volunteer breast-feeding support organisations with members who have had personal breast-feeding experience. The importance of emotional and informational support, as well as the medical advice, is vital.⁽⁶⁸⁾

Difficulties frequently arise with breast-feeding. The results of this study indicate the reasons for stopping breast-feeding as follows:-

- a. no milk - 4%
- b. not enough milk - 16%
- c. mother working - 16%
- d. powdered milk thought to be better - <1%
- e. weaning - 52%
- f. other - 9% (included reasons such as, "baby didn't want milk" to "Doctor told me to stop when I had a Breast abscess".

This compares with other studies which indicate that "lack of milk" is usually the most common reason cited by mothers for discontinuing breast-feeding, breast problems, inconvenience and refusal of the infant to suckle the breast. Other problems which have been cited as leading to ceasing breast-feeding include "the colostrum problem" where mothers and health workers may think that the milk is of poor quality, lack of knowledge regarding the

advantages of breast-milk over infant formulae, large families which demand more time and subsequently younger infants are weaned early, mothers being forced, due to economic circumstances, to work and cultural attitudes where in some societies the breasts are seen primarily as "sex symbols" and are therefore often hidden, making breast-feeding in public places difficult.⁽⁶⁵⁾

For babies who are breast-fed, the weaning period is a time of great danger to life and health. Good weaning demands patience and knowledge (education) from the mother and health workers and support groups. From the age of 4-6 months, breast-milk alone is no longer sufficient to meet the needs of a growing child. If supplementary feeding is not introduced in this period weight gain may falter and resistance to infection is decreased.⁽⁶⁵⁾ Nutrition will play an important role here (see Discussion later on Food Supplementation).

The weaning process varies widely among different cultures, regarding its initiation and termination, variety, quantity, quality and manner of providing the food. Among some poorer traditional societies, the "weaning" food may be limited and monotonous. This monotony of diet combined with the consequences of repeated infections may result in a chronically depressed appetite, leading to limited acceptance of the additional food at a time when it is critical to the nutritional needs of the growing infant. Thus the malnutrition prevalent in the 1 to 3 year olds

in these under-privileged communities may have some etiology in the weaning practise's of the first year of life. Effective intervention to reverse malnutrition (detected early on RTHCS) may require increased attention to providing variety in the weaning diet from at least 4 months onwards.⁽⁷¹⁾ The Zulu community studied use porridge as the "staple weaning" diet and perhaps this warrants investigation.

The appropriate education of Doctors, Nurses, other health workers and "traditional midwives" will play a key role in promoting breast-feeding, maintaining breast-feeding and ensuring "good" weaning practices. A revision in medical and nursing educational curricula would play an important role here and education regarding common, practical difficulties encountered by breast-feeding mothers would not be time wasted (personal experience).

IMMUNISATION

Emergencies such as droughts, floods and earth-quakes in the present day elicit quick often decisive efforts from numerous governments, which usually prevents mass deaths. This type of response is mainly due to the mass media and a change in "World Ethics" which no longer permits developed nations to ignore such events, as happened to the estimated 3 million people who starved to death in Calcutta and Bengal in the 1940's. However, it is estimated that 280 000 children die each week of frequent infections and malnutrition. Of these 12-14 million children (under 5 years) who die annually, it is estimated that immunisation against six major diseases - measles, tetanus, whooping cough, polio, diphtheria and tuberculosis - could prevent 3 million deaths and even larger numbers against the vicious circle of infection - malnutrition - growth retardation.⁽⁷⁴⁾ Surely these same governments and organisations who respond so dramatically to "sudden" emergencies could respond in a similar fashion to this more devastating "chronic" emergency? The technology is already with us e.g. ORT and vaccines, and what is needed now is mobilisation of resources and effective communication of the existing knowledge. "Surely the time has come to put the mass deaths of children alongside slavery, racism and apartheid on the shelf reserved for those things which are simply no longer

acceptable to mankind Of course there are a thousand practical problems to be overcome, and of course it will not be easy to put even known solutions into practice on such a scale. Can we really say that it is too expensive, that we must wait for economic development, when 3,5 million children a year are dying of diseases which can be prevented by immunisation at an additional yearly cost which is less than the price of five advanced fighter planes?".⁽⁷⁴⁾

In 1977 the World Health Assembly adopted a principle of Universal immunisation by the year 1990 (Expanded Programme on Immunisation - EPI). In 1985, heads of state and senior officials of 21 governments joined, with ordinary citizens, in the "Peoples Forum" in New York in the signing of a Declaration of their commitment to immunising all the world's children by the year 1990.⁽⁷⁵⁾ Universal immunisation will not be attained by 1990 but the Declarations by United Nations bodies have challenged and motivated many nations to start on the course to eventual universal immunisation. A few years ago, the immunisation coverage for children in the developing world averaged less than 5%, whereas in 1985 it was estimated that approximately 40 nations, representing over 60% of the developing world's children, had a realistic chance of achieving over 90% coverage (immunisation) by 1990.^(76,77) "The EPI aims to reduce morbidity and mortality from vaccine-preventable diseases through the provision of immunisation for women and children It is now estimated that, world-wide, approximately 40% of children are

immunised against TB, diphtheria, pertussis, tetanus and poliomyelitis and 26% against measles The RSA, not by its own choice, takes no part in the planning and execution of WHO programmes, such as EPI. Possibly as a result of this, South Africa does not have a national programme analogous to the EPI The responsibility for the planning, delivery and evaluation of immunisation services is divided among 14 different national and regional authorities as well as an additional 800 local authorities".⁽⁷⁸⁾ Two of these health authorities (representing KwaZulu and Natal) are responsible for the delivery of immunisation services to the Bomela area studied.

For universal coverage to be attained, co-ordination between the various authorities will be vital. A well organised and implemented national immunisation programme will - apart from preventing an estimated 4 000 deaths annually in RSA - reduce disability, because it is thought that for every death at least one child is permanently disabled,⁽⁸¹⁾ reduce the incidence of gastro-enteritis which in itself is a major cause of mortality in RSA and reduce the birth rate.^(78,79,80)

World-wide, in 1985, it is estimated that measles killed 2 million children, tetanus killed 1 million and whooping cough killed more than half a million. It was estimated that the cost of protection against this carnage would have been 5 U.S. Dollars per child. The cost of universal immunisation in 1985 was estimated to be 500

million U.S. Dollars.⁽⁷⁶⁾ However, finance is not the only restraint to achieving universal immunisation. Management, training, education of health workers and public, supervision, monitoring and organisation of permanent immunisation programmes all present problems in every country which need to be tackled and overcome.

In 1986, UNICEF estimated that, world-wide, immunisation programmes (implemented since 1984) were saving the lives of approximately one million children a year in the developing world. UNICEF estimated that, should the EPI target of universal immunisation by 1990 be achieved, the lives of an additional 3 million children will be saved each year.⁽⁴⁹⁾ Two important developments have enabled the rapid increase in population coverage, of immunisation, since the early 1980's. Firstly the ability of Government's and private organisations to organise the supply of vaccines in correct quantities and in good condition ("cold chain"). This is possible through improved training and management by those responsible for supervising immunisation programmes at local and national levels. The Bomela area is served by a clinic, staffed with nursing personnel, and supervised by medical personnel including a pharmacist from Murchison Hospital. However vigilance is necessary to prevent management problems preventing the supply of adequate quantities and good quality vaccines to peripheral areas. The study did not look at this aspect of immunisation in the area. Secondly, the improved coverage has been made possible by increased demand for immunisation in many areas.⁽⁴⁹⁾ The creation of demand

for this service is now, perhaps, the greatest challenge towards achieving the goals of EPI. For a mother in a developing country to obtain immunisation for a child will often mean devoting at least half a day - work or wages - to travel on foot or by poor public transport, to queue at the clinic for treatment she may know nothing about e.g. "why should my well child be brought to a place which treats the sick?". Bomela clinic sets aside a day a week for the "well baby clinic" where vaccinations are administered. Problems may arise if this day is not suitable to the mother/child-minder to make the trip to clinic. Walking from the periphery of the "catchment area" to Bomela would take at least one and a half hours. Public transport to the clinic is available but is expensive - R0,50 (single trip) added to the cost of lost time, and possibly employment wages. Perhaps vaccinations should be made available each day and at all times convenient to parents. Also education of the community to help them become aware of the reasons for the importance of vaccinating their children is essential if increased demand for the vaccination service is to become a reality. It has been shown in UNICEF studies that the typical pattern for vaccination coverage is that 50-60% of infants will be brought for the first vaccination and "considerably less than half of those will come back for the second and third". The nations which have markedly increased their immunisation levels over the last number of years are those who have improved supply and found ways of increasing the demand for the services. Mass media, politicians, community leaders and churches have all been

successfully utilised in some South American countries.⁽⁴⁹⁾ However, information/knowledge can only be useful up to a point. Knowledge must be put into practise and most parents will need practical on-the-spot advice and help. Vaccinations, ORT and growth monitoring should become part of the accepted way of rearing children.⁽⁸²⁾ Continuous re-enforcing by motivated, well trained and acceptable community members who live in the community is a possible solution to this problem i.e. community health workers. Bomela area at present has no community health worker - the staff at the clinic are too busy dealing with the problems of running the clinic to visit homes. The concept of community health workers supervised by the nurse in the clinic should perhaps be looked at to improve on the current figure of 30% immunisation coverage (complete).

A designated "immunisation programme" manager has been utilised with success in 19 countries of the English-speaking Caribbean. These people are responsible for carrying out and directing the regional programme on a continuous basis. The managers meet on a regular basis (every 2 years) to discuss problems and find solutions. Evaluation is carried out annually to determine the effectiveness of the cold chain and the recording/reporting systems. In 1985, it was shown that 12 out of 19 countries had achieved over 75% coverage with DPT and OPV vaccines vs. 2 countries with over 50% coverage in 1979.⁽⁸³⁾ South Africa could well take note of this as a way of helping to overcome the current extensive fragmentation of health services, e.g. designated

managers for local regions co-operating with and utilising all health authorities currently responsible for health service delivery to the area. Bomela is currently served by KwaZulu Government Health Department and Natal Provincial Administration Hospital Services.

Before discussing individual vaccines and to conclude this general discussion on immunisations, it would be appropriate to summarise the basic information which mothers/child-minders should know if campaigns to improve immunisation coverage are to have continued long term success:-

- a. "General information regarding immunisable diseases, the benefits and possible side effects of inoculations, and the need for repeat doses."
- b. "Specific dates, times and locations and clear directions on who should come for each immunisation session."
- c. "Parents and others who bring children to be immunised should know the following:
 - i. which diseases the immunisations protect against, that immunisations will not protect against all diseases,
 - ii. which age groups are to be immunised and why other age groups are excluded,
 - iii. the need for repeat doses,
 - iv. that immunisations are safe and that side effects, such as fever, are signs that the vaccines are working to build their child's protection, and,

- v. that vaccines do little or no good once a child has contracted the disease".⁽⁸⁴⁾

A. Measles

It is estimated that throughout the world a child dies of Measles every 15 seconds or 2 million die each year.⁽⁸²⁾ In 1970, Measles ranked as the 6th leading cause of death for Coloured and Asian children and the 7th leading cause of death among African children in RSA.⁽⁸⁵⁾ A study of Measles in Ghana showed that measles accounted for 8,8% of all admissions to a paediatric hospital in Accra, the capital, over the period 1973-1982. The mortality rate for these admissions was 16,86%.⁽⁸⁶⁾ Measles is a highly contagious viral disease and essentially all children will become infected with an estimated 1% of those living in developing countries dying of the condition unless protected by immunisation. It is often the youngest and most undernourished children who suffer the severe complications and the highest risk of death. The infection is preventable by the timely administration of a potent vaccine. This endeavour requires a well-managed technical and administrative network that remains difficult to organise in many areas of the world. Health education, improved management skills, publicity and community support/participation are all important factors for ultimately preventing the morbidity and mortality from this disease.⁽⁸⁷⁾

Measles in RSA is still a major cause of morbidity and mortality. It became a notifiable disease in RSA in 1979 and, despite the knowledge that notifications probably only represent a fraction of the real incidence, they do provide some indication of trends.^(88,89) However, notified rates of Measles deaths reveal gross under-reporting if compared with registered deaths due to measles e.g. 1984 - Notified deaths - 239, Registered deaths - 998.⁽⁸⁸⁾ The rates of notified cases of measles in RSA are probably insensitive indicators of actual incidence trends of measles in areas where health facilities are inadequate and "true" population statistics unknown, but where the impact of measles is potentially greatest.⁽⁹⁰⁾

A study in KwaZulu⁽⁹⁴⁾ revealed that between 47-56% had received one dose of measles vaccine. This percentage coverage for measles vaccination was the lowest of all the vaccines studied in the area "in spite of the fact that measles is the most common and most severe of the 6 EPI target diseases seen at Mosvold Hospital." It was also noted that "the overall immunisation coverage was low even in children living within 5km distance of a clinic." Bomela is situated in an area of KwaZulu - further south than the area studied above and the results may therefore not be generalisable to Bomela but both areas are rural and the terrain and types of dwellings and

communities are similar.

An important factor in a national measles immunisation programme is the determination of the optimal age at which the first dose of live-virus vaccine should be administered.⁽⁹⁰⁾ Immunisation at too early an age may result in neutralisation of live-vaccine by residual maternal antibody. The present WHO recommendation, and that followed in the RSA, is to administer the vaccine at the age of 9 months regardless of nutritional status or the presence of minor ailments. Measles vaccine cannot give high sero-conversion rates in developing countries. High birth rates lead to infection at an early age, making vaccination before exposure difficult to attain. It is important, that if vaccine is used early in a programme that continued intensive and well planned immunisation programmes be carried out, to control virus circulation before the next generation is born.⁽⁹¹⁾ This concept of attaining and maintaining "herd immunity" for measles thus presents a challenge to those responsible for providing immunisations to communities. Once again the importance of creating demand for vaccines as well as maintaining supplies of vaccine is underlined.⁽⁸⁴⁾ When it is realised that "of every 1 000 children born into the world, 30 or more die of measles or its complications," and that "in recent years, the stability of measles vaccine has been improved, and vaccines now being provided to the EPI by WHO and UNICEF meet the WHO

standard of being able to withstand up to 1 week's exposure at 37 degrees C. in their freeze-dried state,"⁽⁸⁴⁾ then the view that measles vaccination is one of the most cost-effective public health measures available to children in developing countries,⁽⁹²⁾ takes on a new meaning and presents a challenge to health workers, communities and governments. A major problem with respect to measles vaccine is that it is administered relatively late in the immunisation programme and a high "drop-out" rate occurs after the first doses of DPT and Polio vaccines at about 3 months of age. The importance of the understanding and motivation of mothers/child-minders thus becomes an important factor - especially in measles vaccination programmes.⁽⁸⁴⁾

With the global eradication of smallpox, the question now asked is whether other major cosmopolitan human diseases can be eradicated? Measles and Polio are the 2 major diseases about which this question is asked. An important factor with regard to measles is the early onset of infectivity (vs. smallpox) which makes surveillance and containment very difficult. Eradication of measles (and Polio) would depend on achieving a very high level of effective vaccination, coupled with good enforced legislation and political co-operation and will. This situation will be extremely difficult to achieve in the developing world.⁽⁹³⁾ The rural African communities, including Bomela, have relatively high

crowding index - 3 per room (sleeping), in this study, making transmission of the virus simple, and a mobile population (migrant labourers) enabling "cross boundary" flow of the virus to possible susceptible populations.

B. Pertussis (Whooping Cough)

This is not a notifiable disease in the RSA and the incidence of the disease is unknown. A positive diagnosis is only possible definitively, using culture/serology which is at present not practical in rural areas e.g. Bomela. The questionnaire based a diagnosis of Pertussis on the terminology used in the local Zulu language for the disease. However, it is acknowledged that this is at best inaccurate as the disease may be confused clinically (even by Health Workers!) with Parapertussis and other respiratory infections. Nevertheless, Pertussis remains a disease of major concern - it is estimated that out "of every 1 000 children born into the world, 20 die of whooping-cough".⁽⁸⁴⁾ The disease can occur at any age, but is most dangerous during the neonatal period and is very contagious. The vaccine is administered in combination with Diphtheria and Tetanus vaccines. A study in KwaZulu⁽⁹⁴⁾ estimated that 68-77% of the children had been immunised with the first dose and 47-56% had had a 3rd dose of vaccine.

C. Diphtheria

This disease, was in the past, a major killer of children in "developed" countries. The morbidity and mortality of Diphtheria in developing countries, today, is poorly documented.

It is stated that "the incidence of Diphtheria is at an all time low" in the RSA and 19 cases were notified in the RSA in 1986.⁽⁹⁵⁾ However, it should be realised that notification of diseases is not necessarily a true reflection of the incidence of a disease and cases which could have occurred in the "independent" homelands are not reflected in these figures. The incidence rate (per 100 000) for the Black's (which was the highest recorded) was estimated to be 0,19 (vs. 10 per 100 000 for the same group in 1965). Approximately 52% of cases occurred in children aged 5 years and under.⁽⁹⁵⁾ The percentage of immunisation coverage for Diphtheria will be the same as for Pertussis vaccine, (discussed above) as it is administered as a combined vaccine.

D. Tetanus

This disease may occur at any age but is particularly dangerous during the neonatal period. Neonatal Tetanus results from the contamination of the umbilical stump by

unsterile methods of cutting the cord or by the application, to the stump, of matter such as cow-dung or mud. It was estimated (1985) that out of every 1 000 children born into the world, 10 died of neonatal Tetanus⁽⁸⁴⁾ or an estimated 1 million deaths annually. Immunisation of the mother protects the newborn.

In the RSA the annual incidence rate of reported cases of Tetanus remained virtually unchanged between 1974-1984.^(95,96) Approximately 80% of all notifications were in children under the age of 1 year - probably all neonates. Once again it is important to bear in mind, that notifications may give an indication of trends but the true incidence is probably higher due to under-reporting. Between 1974-1984, 92% of Tetanus cases occurred in the Black population⁽⁹⁶⁾ - indicating a combination of cultural factors and poor access/utilization of health facilities. A total of 219 cases of tetanus were notified in 1985 in the RSA - 44% of these in Natal/KwaZulu.⁽⁹⁷⁾

The incidence of Tetanus has declined markedly in "developed" countries as a result of improved standards of living and hygiene and increased vaccination coverage.⁽⁹⁷⁾ Contrast this with the world figure given above which indicates the importance of Tetanus as a disease in the Developing countries.

It is generally accepted that neonatal Tetanus is grossly under-reported. The occurrence of this condition depends mainly on the immune status of women of child-bearing age and the quality and accessibility of care during pregnancy, birth and the neonatal period, neonatal Tetanus being entirely preventable if the pregnant woman is immune.⁽⁹⁷⁾ In Natal/KwaZulu it is policy to immunise pregnant women against Tetanus (during Ante-natal clinic attendances) - and this is practised in the Bomela area. (This study did not examine the percentage of women who had been immunised against Tetanus). The EPI emphasises the importance of immunising women of child-bearing age (not only pregnant women) as a major strategy in preventing neonatal Tetanus.⁽⁹⁸⁾ Neonatal Tetanus remains a problem where many pregnant women do not receive ante-natal care. This study showed that 38% of children were delivered at home and although it cannot be assumed that the mothers did not attend ante-natal clinic it shows that traditional beliefs and values still hold a prominent place in the community. It was for this reason that the WHO through EPI recommends immunising all women of child-bearing age i.e. school children and mothers accompanying children to clinics or any health contact opportunity.⁽⁹⁸⁾

"Tetanus toxoid is one of the cheapest and most effective vaccines available. There are virtually no contra-indications to its administration, the risk of adverse reactions is

negligible and it is safe in pregnancy Therefore if there is any doubt about a woman's immune status in respect of Tetanus, administration of Tetanus toxoid should be considered and offered".⁽⁹⁷⁾ A study on transfer rate of transplacental immunity to Tetanus, revealed that the level of protective antibody in the newborn and the magnitude of transfer rate of passive immunity to Tetanus depended directly upon the level of Tetanus anti-toxin in maternal serum. Mothers who had received two doses of Tetanus toxoid, spaced a minimum of 4 weeks apart with the second dose given at least 2 weeks before delivery, will protect the neonate (including subsequent newborns) and provide maternal immunity for some 3 years".⁽⁹⁷⁾ This policy is currently being practised in KwaZulu clinics (including Bomela) but as yet no figures are available for the percentage of the total number of child-bearing-age women in the community who have been immunised.

As was mentioned at the outset of the discussion on Tetanus, the disease incidence declined in developed countries with vaccination and improved hygiene and proper umbilical cord care at birth. In many countries (developing) it is estimated that 60-80% of deliveries are assisted by traditional birth attendants (TBA).⁽¹⁰⁰⁾ Over the last few decades, efforts in many countries have been made to regulate, upgrade through training or replace the TBA. The strength of the TBA stems from the fact that she is part of the cultural and social life

of the community in which she lives. She is often a member of the delivering lady's family (personal communication with ante-natal clinic attenders at Bomela clinic).

A weakness of the TBA lies in some of the traditional practises which may endanger her clients e.g. smearing the umbilical cord with mud or cow-dung as allegedly still occurs amongst some Zulu communities (personal communication - professional nurse Bomela clinic). With suitable training, supervision and acceptance, these dangerous practises can be minimised and her potential used to improve maternal and child health in her community. Ways should be sought of identifying and establishing a "working relationship" with TBAs in a community. This is at present not being done in the community studied. It is acknowledged that to obtain cooperation of "traditional healers" (including TBAs) is not easy, but remains a challenge.

E. Poliomyelitis

It was estimated that of every 1 000 children born in 1985, 5 would grow up crippled by Poliomyelitis (Polio). The use of Polio vaccines in the last 20 years in developed nations has markedly reduced the incidence of Polio.⁽⁸⁴⁾ Each year about 300 000 children are affected by Polio and it is the major cause of lameness in the developing world, where nearly

all children will be infected by the Polio virus before the age of 3 years. Although only one out of every 200 infected children develop typical symptoms, one in ten of those with "clinical" polio will die. In the RSA it is a notifiable disease with 71 and 69 cases being notified in 1984 and 1985 respectively - of this number 38 and 4 were notified from KwaZulu/Natal. However, between 1 December 1987 and 7 April 1988, 275 polio patients were admitted to hospitals throughout Natal/KwaZulu. All of these were Blacks except for one Coloured female. "The overall incidence rate in this epidemic was 4,5 per 100 000 with the highest attack rate being experienced by the under-five-age group (24,2 per 100 000). The case-fatality rate was 10,2%. Polio virus type 1 was identified in 94% of typed polio isolates and 16,7% of cases claimed to have had at least 3 doses of the vaccine".⁽¹⁰¹⁾ This epidemic followed a year (1986) in which only 41 cases had been notified in the RSA. It is of interest to note that since 1921 several sharp rises in Polio incidence rates have occurred following a year of very low incidence, namely 1937, 1945, 1948, 1956/7, 1963, 1966, 1968, 1970 and 1982.⁽⁹⁵⁾

This study was performed in June - August 1987 prior to the 1987/88 epidemic and the results obtained pertaining to Polio vaccinations coverage obtained in this study therefore, is presumably lower than the current status, because a vaccination campaign was launched in the Natal/KwaZulu area

during and after the epidemic - including the Bomela area. The figure of 38% for children under two years of age with known full coverage against Polio is low if "herd immunity" is to be attained. During the epidemic of 87/88 at least 18 of the notified cases resided in the health ward in which Bomela clinic is situated - a population of 657 926 (1985 Census). This gives an incidence rate of 2,73 per 100 000 for the health ward, of cases notified.

The RSA is a country where Polio is both endemic e.g. in many rural areas and controlled e.g. White and Asian urban areas. This situation demonstrates the value of:

- a. improving sanitation and water supply (urban areas) and
- b. increasing immunisation coverage (and maintaining this cover).

Two epidemiological patterns for Polio are evident - controlled, found in Developed countries (35%) where widespread immunisation programmes have virtually eliminated Polio and endemic Polio, found in the remaining "Third World" developing nations, with inadequate sanitation, water and health care to provide effective immunisation coverage. The endemic level of Polio is inversely proportional to the extent of immunisation.⁽¹⁰²⁾

Improvements in sanitation and provision of clean water leads

to a decrease in endemic levels of Polio but vulnerability to epidemics of the disease occurring increases if adequate immunisation is not achieved (and maintained) at the same time, due to a build-up of an "immunity vacuum", and a subsequent potential for epidemic activity if a wild type Polio virus is introduced. It is easy to speculate and theorise about the epidemic which involved Natal/KwaZulu in 1987/88 but one of the reasons may have been improvement in hygiene and sanitation (albeit not at a satisfactory level yet) without a concomitant rise in immunisation in the community. The results of this study which showed 27% fully immunised against Polio would seem to indicate that either the recording of vaccine administration on RTHC is inadequate or priority needs to be given to reaching into the community to educate and administer vaccines because major outbreaks of Polio may occur even with 80% vaccine coverage. Countries with controlled Polio have been known to experience outbreaks of "wild-type" Poliovirus in susceptible individuals or communities. A major outbreak occurred in Taiwan in 1982 despite an estimated 80% immunisation coverage. An epidemic in the same year (1982) in Gazankulu (Southern Africa) occurred and it was demonstrated in a serological survey that a pattern of inadequate immunisation existed. Thus the epidemic may have occurred due to the "immunity vacuum" which occurs where sanitation and water supplies had improved.⁽¹⁰²⁾ This Gazankulu outbreak and perhaps the Natal/KwaZulu epidemic

of 1987/88 would demonstrate the extreme importance of monitoring (any vaccine preventable disease) as well as managing an effective immunisation programme.

Polio is a statutory notifiable disease in the RSA (clinical and laboratory cases). This method of monitoring will inevitably result in under-notification of the true incidence but may still be of value in demonstrating trends in incidence. A study in Ghana demonstrated, by means of a lameness survey, that the incidence of paralytic Polio was 7 times the suspected incidence based on notifications.⁽¹⁰³⁾

Another method used to monitor vaccine coverage is to determine vaccine distribution (quantity and geographical) and from RTHCs. In the RSA, data on vaccine distribution and administration are available from the Epidemiological Department of the Department of National Health and Population Development (Epidemiological Comments). Areas where immunisation programmes may be waning can thus be identified. RTHCs, if used correctly, provide an invaluable means of assessing immunisation status of an individual child and a community. The RTHC was the sole basis used to assess this coverage in this study. However, the weaknesses of the RTHC system must be considered (see Discussion on Growth Monitoring above). Also, the RTHC does not account for failed vaccination as a result of poor quality vaccine e.g. "cold-

chain" breakdown, vomiting of vaccine, and poor documentation on the RTHC. No account is taken of the "herd immunity" factor which results with the use of Oral vaccine (Polio) i.e. natural immunisation by environmental vaccine.

The process of analysing the sera of a sample of a population is sometimes utilised to assess the prevalence of immunity to a particular disease e.g. Polio. This is however costly and involves much administrative and technical "know-how". However, it is the "only objective method of determining population immunity, especially in a developing country."⁽¹⁰²⁾ A serological survey could possibly have prevented the 1982 Gazankulu epidemic (and possibly the KwaZulu epidemic of 1987?) as it was subsequently shown that 74% of the patients in Gazankulu had not been immunised (lack of antibody to Polio types 2 and 3).⁽¹⁰⁴⁾

Another important aspect of any vaccination programme is the testing of vaccines being used in "the field" for potency. The vaccine is recalled from the periphery e.g. Bomela clinic, using strict cold-chain conditions and tested in a laboratory for potency. The WHO has recommended a minimum potency level for Polio vaccine of 300 000 tissue culture infective dose (TCID₅₀) per dose. The vaccine used in Gazankulu during the 1982 epidemic was found to be of sub-optimal potency in about 50% of recalled specimens "and may well have contributed to

failed immunisation in a certain proportion of cases.^(102,104) Thus Laboratory testing for vaccine potency is valuable in determining the efficiency of vaccine transport and storage (cold-chain) conditions.

To date no serological or laboratory testing for vaccine potency has been carried out in the health ward in which Bomela clinic is situated. The number of vaccines administered and the RTHCs thus, are at present the only way of assessing (albeit crudely - see Discussion above) the coverage for Polio vaccination in the area. As was mentioned earlier, the results of this study showing 27% with a recorded 3 doses does not reflect the current status, as the mass immunisation campaign carried out during and after the 87/88 epidemic in the region was subsequent to the study (July '87).

It was estimated that if immunisation remained at the 1986 levels, without increasing, that throughout the world Polio would cripple 2,5 million children in the next decade. This in itself would cause serious personal suffering and economic burdens for the individuals, families and governments.⁽⁸⁴⁾ The technology to prevent this is available at present, the problem lies in organising health workers and communities and creating, by some means, the demand for vaccination. Both forms of available Polio vaccine are highly effective and safe (inactivated Polio vaccine, (IPV), and Oral Polio vaccine

(OPV).⁽¹⁰²⁾ Polio has largely been eliminated from parts of the Developed World⁽¹⁰⁵⁾ and areas of the Developing World such as Hong Kong, Cuba and Brazil⁽¹⁰²⁾. OPV is the most widely used vaccine and is the one used in KwaZulu (and Bomela clinic area). It is easy to administer, relatively cheap and produces "herd immunity". One of the problems, is maintenance of the cold-chain - thought to have been associated with loss of potency of vaccine in Gazankulu in 1982⁽¹⁰⁴⁾, - and research at present is being conducted to make the OPV more stable. However, another problem associated with the use of OPV in Developing countries is the phenomenon of interference-inhibition by other enteroviruses or enteric viruses (e.g. Rota virus) which decreases the effectiveness of the vaccine. The extent of this phenomenon as a practical problem in the RSA is not clear. It would appear however to play some role, as the Gazankulu epidemic of 1982 showed that 7% of the patients gave a history of being immunised with 3 doses of OPV and a serological survey in the area in 1983 showed that 22% of subjects who had received 3 doses of OPV lacked neutralising antibodies to one or more Polio types.^(102,104) The extent of this problem in KwaZulu remains unknown. One method of overcoming this interference phenomenon would be to use IPV instead of OPV. An advantage of IPV (over OPV) is that 2 doses appear to provide long-lasting immunity and can be combined with DPT vaccine. Two doses of a vaccine may prevent possible "fall off" in attendance experienced between 1st and

3rd doses of OPV.⁽⁸⁴⁾ However, a major disadvantage of IPV (vs. OPV) is that IPV does not provide herd immunity in countries where faecal-oral transmission is the major mode of spread of Polio virus. This is the major mode of spread in developing countries due to poor sanitation and hygiene and lack of good quality water. Thus extremely high levels of vaccine coverage would be required if IPV were to be used, to ensure community protection and at present this would appear to be a major constraint in rural communities e.g. Bomela. Another disadvantage of IPV is the increased cost over OPV.

There are alternate strategies, to the routine schedule of administration of OPV (and indeed any vaccine). Mass immunisation campaign's have been successfully carried out in India, Mexico and Cuba.^(85,106,107) However, organisation of national mass "immunisation days" places enormous burdens on health care resources. They do have some benefits including what has been called "fire-fighting" capabilities to control epidemics⁽¹⁰⁸⁾ and as a possible "first step" in delivering and creating demand for Primary Health Care (PHC) services. However, mass campaigns must inevitably lead to the diversion of health services from other needy areas to organise and "run" the campaign. This is an inefficient way of managing health resources as each programme or service thus requires its own organisational structure. Extensive mass immunisation campaigns which are not followed by further such campaigns or

increased routine vaccination may ultimately lead to another epidemic (see discussion of vacuum effect above).⁽¹⁰⁸⁾ The logical approach for vaccine delivery in this community would appear to be the extension of PHC into the community by increasing access to and demand for vaccines. Vaccine delivered as part of ongoing PHC (especially Maternal and Child Care (MCH)) leads to better recording of vaccines given, greater continuity of follow-up, less "lost-immunisation" opportunities and more timely immunisations.⁽¹⁰⁸⁾ The 27% recorded coverage for Polio vaccinations in the Bomela community prior to the mass campaign would indicate that increased penetration and acceptance of the role of PHC and clinic services is necessary.

F. Tuberculosis

Tuberculosis (TB) is one of the six target diseases of the EPI. BCG vaccination for all newborns has been compulsory by law in the RSA since 1973. It would seem, in the RSA, from the limited information available, that coverage of more than 80% of the target group has been achieved.⁽¹⁰⁹⁾ Mass BCG campaigns have been phased out and BCG is now administered as part of routine immunisation schedules. The results of this study would indicate that 80% showed signs of having received BCG (FIGURE 25). It should however, again be borne in mind that the percentage covered is, *per se*, only one of the factors associated with success of a particular immunisation programme as vaccine potency and correct administration are equally important and this study does not aim to show success in either of these 2 areas for any of the diseases/immunisations discussed. Areas where programmes succeed or fail include both managerial and technical aspects and a limitation of this study is that "coverage" does not demonstrate any aspect of the quality of vaccine and its administration or the ability of the vaccine e.g. BCG to protect against tuberculosis.⁽¹⁰⁹⁾

"TB is most commonly a disease of adolescents and adults. The total number of world-wide tuberculosis deaths in children

under the age of five years is not known with precision, but it is thought to be some 30 000 annually. Two-thirds of these deaths are attributable to TB meningitis, to which young children are particularly susceptible. Although the protective effect of immunisation against TB in older person's is presently an unresolved question, its efficacy in young children has not been put in doubt".⁽¹¹⁰⁾ Of the four TB control measures currently used i.e. BCG vaccination, preventive treatment, chemotherapy and case-finding, that of BCG immunisation is the most challenged e.g. the results of a large trial in India (Southern) were negative, but results of other trials proved positive, with some showing a protective effect of 75-80%.⁽¹⁰⁹⁾ However, it is believed that BCG protects against the more serious forms of TB e.g. TB meningitis, which are the "killer forms" in children.⁽¹¹¹⁾ Information on BCG efficacy in Southern Africa is scanty. Most studies have concentrated on the delayed hypersensitivity response to tuberculin following BCG vaccination as an indication of vaccine quality - as distinct from vaccine efficacy. A recent urban study demonstrated protection against mild and serious forms of tuberculosis in children under 5 years of age with BCG scars of 65%, as opposed to those children without scars.⁽¹¹²⁾ Another study in the RSA demonstrated that 23% of 176 children who had been vaccinated with BCG, developed TB. However, it was noted in the same study that BCG vaccination appeared to have diminished the incidence of serious forms of

TB.⁽¹¹³⁾ Another study, in the RSA, indicated that BCG protects against all forms of TB.⁽¹¹⁴⁾ However, it would appear that many tuberculosis workers are discouraged at the lack of progress in TB research and control and the dubious results of expensive anti-TB campaigns. Southern Africa is still a high-prevalence area for tuberculosis and recent statistics show unfavourable trends in certain population groups.^(115,116,117)

A major share of the problems encountered in tuberculosis programmes appear to be managerial and not technical. This means that new techniques and new treatment are unlikely to improve the situation. Thus, at present, the most important factor in increasing the impact of control measures against TB would appear to be by more effective application of conventional techniques.⁽¹¹⁵⁾ In the Bomela area (studied) control measures for TB are in operation e.g. BCG vaccinations, case-finding by mobile clinic teams (KwaZulu and NPA) and ambulatory treatment supervised and monitored by Murchison Hospital staff in conjunction with a SANTA educator. However, the rates of notification for the Bomela area (specifically) are not known and it is doubtful if one could extract the information from available statistics due to e.g. migratory work force, several names per individual in the community, wrong addresses and an unknown population denominator. Increasing community involvement has been suggested as a means of increasing the impact of control

measures (current SANTA policy) - but these campaigns have not been evaluated yet to determine their effectiveness. Ambulatory treatment is now practised, where feasible, in the Health ward where Bomela community resides and provided adequate supervision and proper selection and training of supervisors is carried out, may yet ensure success of TB control programme in this area. Local conditions in the area are important and nationwide trends are of little value to tuberculosis control personnel in small communities. A particular method of control may be ineffective on it's own e.g. BCG vaccination, but play an important role in a "chain" of measures. "Therefore isolated evaluation of methods such as intermittent treatment or intensive case-finding may not yield meaningful results".⁽¹¹⁵⁾ A carefully planned, implemented and monitored programme designed for local communities is essential and the current procedures in the Murchison Hospital catchment area (as a part of the total "health ward" system) are being studied (personal).

BCG vaccination is compulsory in 64 countries and officially recommended in a further 118. Almost all developing countries apply the policy of BCG vaccination to newborns. In the RSA, BCG vaccination has been compulsory by law since 1973 and vaccination at school entry and leaving is recommended.⁽¹⁰⁹⁾

Information on vaccination coverage in many areas of Southern

Africa is still lacking and Ijsselmuiden et al⁽¹¹⁸⁾ express concern at the inadequate and inconsistent documentation of vaccination administered, which hampers evaluation of immunisation programmes (see Discussion on RTHCs above). Official statistics on BCG vaccinations administered to children under 1 year of age in the RSA in 1983 indicated a coverage of 68% at birth and 35% at 3 months - but it is probable that greater than 80% coverage is being achieved. This compares with the estimated coverage of 80% in the Bomela community as judged by presence of a scar (BCG).

It should be noted that BCG vaccination is beneficial to the individual rather than the community as TB in childhood is not a major source of secondary infection to other members of the community - i.e. BCG does not effectively prevent a source of infection. Thus any decline in the incidence of TB should not be considered as a measurement of success of EPI. However, the current policy of the WHO on BCG vaccination stresses the desirability for continued use of the vaccine.⁽¹⁰⁹⁾

The mortality rate (MR) for TB in children under 5 years of age in the RSA (1968-1977), shows that the rate remained unchanged for Asians, Coloureds and White population groups.⁽¹²⁰⁾ TB was ranked ninth (9th) as a cause of death in Black children aged 0-4 years in 1970, with a mortality rate of 65,6/100 000.⁽¹²¹⁾ The role of BCG in preventing these deaths

could be of major significance as discussed above and thus the programme should continue. However proper handling of vaccine by trained, motivated staff is essential. Furthermore it is considered that vaccination should be carried out with the Japanese vaccinating tool instead of the Heaf apparatus, as it is easy to use, is not prone to technical failure and is more hygienic "in the field".⁽¹⁰⁹⁾ (If staff are properly trained to use it.)

FAMILY SPACING (PLANNING) (F.P.)

Compared with most other Continents, Africa has a low population density with a wealth of natural resources. However this is a rather simplistic picture as, the unpredictability of rainfall, poor quality of soil, and poor farming practices and unfavourable environment for agriculture which exists over much of Africa is ignored. In addition, large areas of land which would be suitable for farming are not utilized due to the presence of tsetse flies, river blindness and other endemic disease problems. Forty-one sub-Saharan countries have been classified on the basis of the "potential capacity of a country's agricultural land to support it's population's minimum nutrition needs". Fifteen of these countries did not have adequate usable farm land to support their 1975 population with the technology used; and these countries accounted for half of the sub-Saharan African population.⁽¹²²⁾

Africa has the fastest growing population of any region in the world, increasing at a rate of over 3 percent per year. This means that the population doubles in just over 20 years i.e. an estimated 1 billion people by the year 2005. Children under the age of 15 years constitute 45 percent of the population compared with 37 percent in Asia and 40 percent in Latin America. This also compares with a figure of 42% under 15 years of age in the Bomela community studied (FIGURE 1). The current demographic structure

(population pyramid) indicates that the population growth rate will accelerate further before stabilising, "even if effective population planning is introduced immediately".⁽¹²²⁾

Few countries in Africa have actively committed themselves to reducing population growth. In 1984, The second African Population Conference avoided any direct reference to population growth in the continent, yet called for "effective programmes to reduce current high levels of fertility and mortality and to alleviate the uneven distribution of population". The fact that sub-Saharan Africa records the highest infant and maternal mortality rates in the world is partly related to the fact that African mothers have the highest rate of pregnancy in the world.⁽¹²²⁾

"The ability of a country to ensure an acceptable standard and quality of life for all its people is directly linked to the balance between its population size and the extent, replenishment and replacement of its available resources..... The South African population presently grows at a rate of 2,3% per annum (Blacks 2,8%). If this growth rate would continue the present South African population (including KwaZulu) of approximately 28 million would increase to..... 79 million in 2020..... It is calculated that South Africa can, in terms of its surface and underground water resources, accommodate an optimal population of approximately 80 million".⁽¹²³⁾ In a report on Demographic Trends in South Africa, the Science Committee of the President's Council

concluded that the "vicious circle existing between poverty and high fertility will be more difficult to break if the high growth rate continues". The report recommended that a method be found to break the circle. The Population Development Programme (PDP) was formulated with the main objective being to improve living standards and the quality of life of all the peoples in South Africa. Two of the specific objectives of the PDP were firstly a main demographic objective of a population of 80 million and secondly, a Total Fertility Rate (TFR) of 2,1 children per family. "Practice and research clearly show that when the quality of life increases, fertility decreases". The PDP in RSA is extensive and encompasses Social (including Health), Economic and Physical spheres.⁽¹²³⁾ One of the components of the PDP is Family Planning which is supervised by both Natal Provincial Administration (Hospital Services) and KwaZulu Department of Health in the Bomela community. However even within the PDP, family planning is a minor component when compared to the importance attached to the community development (including education) component. Family planning (spacing) should be put into proper perspective as far as any Development Programme is concerned.

Further studies to estimate the independent effect of family planning programmes on the fertility of the developing world, calculated that only 5 percent of the variation in crude birth rate decline for 89 developing countries is due to family planning programmes, substantially less than past estimates.⁽¹²⁴⁾ It is

suggested that the allocation of resources to the various components of the PDP be analyzed and re-allocated appropriately where necessary if the family planning component of the PDP is aimed at reducing fertility and not (as discussed below) to improve Maternal and Child Health.

It will be recalled that the main objective cited for the PDP in the RSA was "the improvement of living standards and the quality of life of all the peoples in South Africa".⁽¹²³⁾ Family Planning is given as one of the components to achieving this objective. This concept is supported by various authors.^(125,126) Even if the world was not experiencing the rapid increase in population size, a powerful case for family planning as a method of improving mother and child health, exists. The more numerous and closely spaced the pregnancies in a woman's child-bearing cycle, the more her nutritional reserves becomes depleted - and the greater the risks to the health of both mother and child. In poor communities it has been estimated that the Infant Mortality Rate (IMR) for babies born within 1 year of a previous birth is usually between two and four times as high as for babies born after an interval of two years or more.⁽¹²⁵⁾ It is also stated that "if child-bearing starts too soon in life, if too many births are spaced too closely together, or if child-bearing continues too late, the women concerned are at increased risk".⁽¹²⁶⁾ It is only in African countries that there is a large proportion of births at both early and late ages. Japanese and American women complete child-bearing in 3-4 and 4-5 years

respectively as a rule, whereas in Africa the average woman takes 19-20 years to complete child-bearing.⁽¹²⁵⁾ This not only presents considerable stress to the health of mothers but also prevents women engaging in economic activity.

Not only do short intervals between births tend to lead to high maternal death rates, but "spacing of less than 2 years between births is especially hazardous because it means lower birth weights and poorer nutrition..... children born into closely spaced families experience more sickness, slower growth, and lower levels of academic achievement".⁽¹²⁷⁾ Short birth intervals also contribute to malnutrition in young infants by putting an early end to breast-feeding. Various studies have demonstrated higher death rates among children weaned early.^(127,128) Thus from the foregoing discussion it would appear that by reducing the number of short birth intervals, family planning can prevent many unnecessary deaths and much ill-health among women and children. It has been stated that "few preventive health measures can have so great an effect in a relatively short time as the implementation of a family planning programme providing easy access to effective methods of contraception".⁽¹²⁸⁾ It is estimated that in developing countries about 5,6 million infant deaths and 200 000 maternal deaths could be avoided if women chose to have their children within the safest years, with adequate spacing between births and completed families of moderate size.⁽¹²⁷⁾

The results obtained in this study indicated that 47% of women of child-bearing age practised some form of family spacing. However, obstacles do stand in the way of accepting contraception (F.P.) by many men and women. One of these is the high IMR experienced in many developing countries. It is difficult to popularise family planning when up to 40 percent of children born die before the age of 5 years. Another obstacle is the often perceived notion that family spacing (contraception) is yet another political ploy to prevent expansion of groups opposed to the "government of the day". Thirdly, education should be given top priority. The mass media do not in general contribute adequately to education on family planning and health.⁽¹²⁹⁾ Family Planning services are easy to provide through primary health care delivery systems. Non-physicians, including community members themselves could provide most contraceptives safely and effectively⁽¹²⁹⁾ - and yet personal experience demonstrates family planning clinics based in hospitals where adolescents are expected to attend under the scrutiny of numerous types of hospital personnel and patients! Perhaps it is time that the provision of family planning services, for so long dominated by health personnel, be taken out of their hands, and be made the responsibility of trusted community members. It has been shown that the convenience of family planning services considerably affects their acceptability. The location of clinics, the opening times and degree of privacy afforded to clients are all important factors. The community must be consulted and used to provide these services. Governmental organisations should be prepared to co-

operate with non-governmental organisations.⁽¹²⁶⁾ In the Bomela community the results showed that 31% of women attended the clinic for contraceptives, 53% attended no-where. A review of the methods used and co-ordination between all parties is warranted. Traditional birth attendants (TBA's) may be a fresh approach to promote family spacing but they cannot serve as the principal agents in any national programme e.g. PDP. They can however influence their own clients. Much work to break down barriers between health services personnel and TBA's would have to occur however before this concept becomes a reality.⁽¹³⁰⁾

It is to be emphasised that Family Planning, in itself, is but one of numerous components of the Population Development Programme (RSA)⁽¹²³⁾ - and should be treated as such with due regard to all the other numerous components to any community development programme. In this regard the importance attached to health education within the broad spectrum of primary health care (PHC) - including Family Planning - must not be underestimated and will be discussed below (Female Literacy). The Alma-Ata Declaration designated "education concerning prevailing Health Problems and the methods of preventing and controlling them" as the first of eight essential activities in PHC".⁽¹³¹⁾ Family Planning is but one small component of PHC.

The results obtained in this community survey would indicate that 38% of children under 5 years about whom information was obtained were delivered at home. As the Bomela clinic or the hospitals

serving the area do not run a home delivery service it would thus appear that there is a very active "Traditional Midwifery " Service (TBAs). Many of these TBAs are relations (mothers, aunts, grandmothers) of the woman delivering (personal communication with Antenatal Clinic Attenders and nursing staff at the peripheral clinics). It has been estimated that between 60% and 80% of babies born in the developing world are delivered by traditional midwives who are usually older, non-literate women who have learned their skills through apprenticeship and socio-cultural experience. The fact that so many babies continue to be delivered at home poses the question - can TBAs play a role in family planning programmes? How can TBAs help encourage family spacing in less developed communities, as well as contributing to improving maternal and child health? Societies depend heavily on women to provide health care, yet women's own general health is frequently neglected and care for reproductive health may be restricted.^(132,126) It has been demonstrated that TBAs can learn new concepts if presented in an appropriate way, they do influence their clients and encourage some to adopt family planning. On the other hand, TBAs are rarely active recruiters outside their own clientele, and they cannot serve as the principal agents of change in a national programme. Many attempts at involving TBAs in family planning programmes were not successful⁽¹³²⁾ and evaluation of existing programmes, commenced in many countries, have been minimal. Which TBAs are selected to participate in a programme makes a difference. Younger women are sympathetic towards family planning, but older women - who would

appear to predominate in the Bomela community - have more influence in their communities. Training TBAs poses additional problems. Trainers often are young nurses with less practical experience than the TBAs and so lack authority. Certain basic issues involved in all Family Planning programmes where TBAs are utilised must be addressed. These include:-

- a. government and health system support and understanding for TBAs;
- b. community support for programmes involving TBA;
- c. type of family planning responsibilities and methods the TBAs will be involved with;
- d. selection of TBAs for participation (ideally all!);
- e. training of TBAs;
- f. supervision, remuneration and evaluation of the TBAs' performance.

Much work/research has still to be performed before TBAs become incorporated fully into family programmes but as long as they continue to enjoy the support of so many in the community they should not be ignored in health planning/service delivery to such communities. A study performed in Indonesia, showed that semi-literate TBAs were able to use risk indicators in antenatal care, if risk factors were clearly defined, and continuous training and supervision were provided. The antenatal card with the patient's records was found to be a crucial element in the success of this particular study and necessitated the design of a card with a

simple layout which could be interpreted by the TBAs.⁽¹³³⁾

In concluding this discussion on Family Planning it is appropriate to quote from an article on family spacing which stated, "It is often assumed that women in developing countries have large families because they choose to. In many developing countries, however, large proportions of women want no more children World Fertility Survey data disprove the common assumption that poor, uneducated women in developing countries generally want as many children as they can have or "as many as God sends".... For example, among women with three living children the proportions who said that they want no more children were 24% in Jordan, 35% in Nepal and 60-70% in Bangladesh and Thailand".⁽¹³⁴⁾

FEMALE EDUCATION (LITERACY)

A recent UNICEF report,⁽¹³⁵⁾ outlined a list of priorities for action to meet "basic human needs in difficult times and rebuild the human foundation for sustained development. One of the priorities listed is termed "Basic Services" and one of the components of these services was basic education including literacy and non-formal education programmes for youth and adults. Another of the priorities listed is to recognise the key role of women. Women are producers and providers of food for families, are managers of household resources, ensure the well-being of children and thus need more support in order to alleviate the often enormous strains imposed upon them. It is proposed that expanding womens' educational opportunities by introducing special programmes to ensure that young girls complete primary education, and introducing programmes of non-formal education and literacy for adult women, would promote self-help activities and community development programmes, as women play such a vital role in these programmes. "For the sake of saving the time and resources of mothers, as well as the lives and growth of their children, it is a matter of particular priority that all such educational programmes should include knowledge of basic health measures such as ORT, immunisation, Breast feeding, growth monitoring and improved weaning practices"⁽¹³⁵⁾ (i.e. GOBI).

The results obtained in this study would indicate that 52% of mothers had not completed Standard (STD) 5 level of education. A level of education of less than STD 8 would not permit a person to read a daily newspaper with understanding (personal communication with headmaster of local Bomela school). One of the components of the Population Development Programme (PDP) in the RSA, and an important one, is the education project.⁽¹²³⁾ A number of indicators are listed which are used to measure the progress of the PDP and one of these indicators is standard of education with the subgroupings of "literacy percentage", "education level" and "education qualifications". In the article⁽¹²³⁾ it is further stated "... being aware of the fact that 42% of our population is less than 15 years old, education (formal and informal) is arguably the most important factor" (in community development). Statistics derived from the 1980 RSA census indicated that the target groups for education are children and adults - male and female - "but emphasis can surely be placed on the education of women, specifically in the Third World context, as this is the social indicator that correlates most closely with declining fertility across the whole range of development. The attainment of literacy itself brings an initial abrupt reduction in fertility. It declines further as women's average education level is progressively raised to primary school..... then to college. Paralleling this, the economic indicator closely correlated with fertility decline is women's participation in the paid work force outside the home".⁽¹²³⁾ Research in many countries shows this clear

correlation between high levels of female literacy and low levels of infant and child mortality. It has been stated that "the education of girls is one of the best health investments which a developing country can make".⁽¹³⁶⁾

Not only is female literacy (education) associated with declining fertility but an association has also been demonstrated with level of education and infant and child mortality. Census figures from Ghana (1960) showed very large differences in child survival by education of mother. The proportion of children dead was almost twice as high for mothers with no education as for mothers with elementary education, and over four times as high as for mothers with secondary education. Similarly, a study in Bangladesh concluded that "... the single most important correlate of child survival is not, as might be expected, the family's wealth or the availability of medical facilities, but the mother's educational level..... why this is so is unknown and is the subject of on-going research".⁽¹³⁶⁾ Thus during the past 20 years a considerable amount of information has become available from developing countries showing that maternal education has a strong impact both on child/infant mortality and fertility levels declining. On average it has been estimated that "each one-year increment in mother's education corresponds with a 7-9% decline in under-5's mortality.... and economic advantages associated with education (income, water and sanitation) account for about one-half of the overall education-mortality relationship. The influence of use of

preventive and curative health services as a group of intervening variables is complex and variable".⁽¹³⁷⁾ The importance of employment opportunities being available to those who have been educated thus becomes vitally important and the responsibility falling on those advocating economic sanctions becomes great. The degree of unemployment resulting from sanctions imposed on the RSA is difficult to estimate but in the long-term will be considerable. Further, the inequality in education due to the Apartheid policy is also responsible for females (and males) of the Black population group being at great disadvantage educationally and economically. However this study merely indicated the level of education of mothers and levels of unemployment and did not set out to determine causes and solutions. Presented above are 2 main arguments which try to find the reason for the association of maternal education and child mortality - one an economic one and another the argument that education and thus knowledge empowers a woman to seek out appropriate health facilities and to make herself understood to health care providers i.e. she becomes a participant in providing health to her children.

Data on literacy and non-formal education opportunities are incomplete. Statistics provided to UNESCO by governments in Africa (excluding the RSA) indicate that half of all Africans over 15 years of age in 1980 were illiterate; among women the figure was over 70%. In many rural areas the figure was estimated to be over 90% illiteracy.

At present in the Bomela community no literacy programme is operating for the adults in the community. The 2 schools in the area are rarely utilised after school hours and perhaps a literacy programme should be initiated by teachers and interested community members.

However, despite many studies seemingly demonstrating a positive relationship between maternal education and fertility decline it was demonstrated in one study in urban Nigeria, that women's education was found to have a "strong negative relationship with breast feeding and post partum abstinence. The use of contraception was low in this community and marital fertility for educated women was higher than for illiterate women.⁽¹³⁸⁾ The problem is thus complex and policy implication/decisions need to be carefully considered.

In concluding this discussion of female education as a component of PHC (through GOBI-FFF) it should be noted that, although, as has been stated above, empowering women through education has enormous potential for raising the levels of maternal, infant and child health ⁽¹³⁴⁾, discrimination against the education of girls still persists. This is shown in figures released from low-income countries, where 90% of boys aged 6 to 11 are in primary school, but only 64% of the girls are.⁽¹³⁶⁾ The problem needs to be tackled at primary school level and to do this both the Education

Department and Health Departments will need to co-operate to develop appropriate curricula for local communities. This process does not happen within a year or two but a start must be made.

FOOD SUPPLEMENTATION

Having discussed PHC at the level of GOBI - which attempts to prevent mortality and morbidity in children (under 5 years of age) and having discussed Family Planning and Female Education (Literacy) - which are also linked to PHC and intervening to help children, it remains to discuss Food Supplementation aimed at children and mothers to prevent mortality and morbidity in both groups. One of the prime causes of infant death is low birth weight (LBW), (along with diarrhoeal diseases), and the majority of infant deaths in "developing countries" occur within the first 3 months of life as a result of the above 2 conditions.^(139,140)

Babies weighing less than 2500 grams at birth have a 3-fold increased risk of dying in infancy. It is estimated that over 90% of the 20 million LBW babies born annually are born in developing countries. This study did not attempt to determine birth weights of babies - but a crude attempt (using nutrition of pregnant mothers) was made to determine if mothers are adequately nourished in pregnancy. The results showed that 68% had a protein rich source 3-6 times/week whereas 22% had very little protein, (≤ 2 x/week).

The role of Breast Feeding and weaning in preventing malnutrition in the under 5 years has been discussed above and will not be

further discussed here.

It is thought that conception does not take place unless the mother possesses a certain amount of energy reserve in the form of fat stores.⁽¹⁴¹⁾ A significant proportion of the maternal energy reserves act as a guarantee for lactation which imposes the highest dietary energy demand of the life cycle. In a well nourished mother, a transfer of energy to the infant occurs which is thought to "buffer" the infant during the critical weaning period. Thus malnutrition is not simply the result of poor infant feeding, but is often more likely to be the result of poor maternal fat reserves resulting in a correspondingly low foetal fat reserve.⁽¹⁴¹⁾ The analysis of the study above lead to the proposal that preventive measures need to include maternal nutrition and to increase the level of fat consumption. In developing countries - including KwaZulu (Bomela) - the carbohydrate-rich diet may be too low to meet the energy demands for early growth and development. The proposals of this study, are supported by recommendations made for priorities for research in maternal nutrition in the developing world.⁽¹⁴²⁾ The author recommended that 2 measures of satisfactory maternal nutrition are:-

- a. adequate birth weight and
- b. successful lactation and it was further recommended that national supplementary feeding programmes for pregnant mothers be considered and training of PHC workers to improve maternal nutrition be implemented.

No such supplementary feeding scheme exists at Bomela. A scheme whereby families at risk, as assessed by the professional nurse at the clinics, were helped with the supply of a protein-mineral-vitamin food "package" did exist until 1986 - when it was stopped - apparently due to supply problems and financial restrictions (personal communication with clinic staff). This scheme is again functional since 1989. At present families - including pregnant mothers assessed as "at risk" of malnutrition - can be referred to a social worker, but this system is not effective due to long delays (administrative) in applying to the social worker, being assessed and finally receiving assistance.

In order for Family Planning programmes to be as effective as possible - and in order for the PDP to be successful - programmes aimed at improving the quality of life of women should be seen as a priority. "Family Planning and maternal health care reinforce one another in the fight to reduce maternal mortality, and should go hand in hand".⁽¹²⁶⁾ This poses the question:- Why were food supplements stopped at clinics whilst the Family Planning Programme continued with apparent vigour? Maternal mortality has received little attention, in comparison to infant and child death rates, amongst most PHC workers. Yet women, as well as suffering the "usual" prevailing illnesses and deaths of any community, in addition, bear the brunt of reproducing the human race. Large numbers of women still suffer and die unnecessarily in

childbearing. One of the major "indirect" causes of maternal death is malnutrition.⁽¹²⁶⁾ It has been estimated that 200 000 maternal deaths that are preventable by Family Spacing, occur annually.⁽¹⁴³⁾ It would not take a scientific study to show that a maternal death puts newborns and infants of that mother at increased risk of death and morbidity. It is believed by some, but not proven, that contracted pelvis - which is a common cause of obstructed labour in the Zulu community studied (personal experience) - may be due to maternal malnutrition. It is worth mentioning here that it is felt that "the bulk of the decrease in maternal mortality in England and Wales has been credited to wartime food policies....".⁽¹²⁶⁾

Yet another author states,⁽¹⁴⁴⁾ "The effects of malnutrition are most serious in early life and especially during foetal life. Inadequate nutrition in foetal life is a common cause of low birth weight.... Mortality in the newborn period is also 8 to 10 times that in infants of adequate weight and this increased likelihood of death is present up to the age of one year."

Available evidence suggests "that wherever LWB rates are higher than 10-15% it can be assumed that significant undernutrition among mothers is widespread".⁽¹⁴⁰⁾ So much for the effects of maternal malnutrition in pregnancy and lactation but what can alleviate the situation? Results of studies from eight countries demonstrated that "supplementation provided during the third trimester of

pregnancy will increase birth weight, a finding which is consistent with rapid increase in foetal weight observed during this period. Several studies reveal benefits from supplementation initiated during earlier periods in gestation".⁽¹⁴⁵⁾ Another study in Guatemala⁽¹⁴⁰⁾ found that the percentage of LBW babies was 21% in the group where the pregnant women were receiving low supplementation (less than 5000 calories) during pregnancy and fell to 4% in the group receiving a high level of supplementation (40 000 calories and over). Thus it would appear that an economic and effective way to use supplementary feeding programmes would be to identify those pregnant or lactating women who are malnourished and distribute food supplements to these women. Identification of these women could be done in a number of ways - but the method which is currently used at Bomela clinic (and all KwaZulu clinics in the Izingolweni areas) - is to weigh Ante-Natal clinic (ANC) attenders at each visit to monitor weight gain. The problems of weighing accurately and acting on the results will not be discussed here but should be borne in mind. If a food supplementation programme was to be introduced the identification of "at-risk" women would be important and appropriate detection methods should be utilised. Suffice it to say that "in theory" - the measures required are simple to obtain (scales, tapes) and not difficult to apply (if training is appropriate). However, mothers not attending ANC would not be detected - and this would exclude a fair proportion (see results for number of babies born at home). We have discussed the results of maternal malnutrition on both maternal and perinatal and

infant mortality. What about the cost of its prevention?

Much malnutrition could be prevented (amongst pregnant women) if attention was paid towards appropriate health education aimed at local communities i.e. health education aimed at cultural beliefs and encouraging useful/beneficial habits or customs and modifying detrimental habits. Several studies have shown that simply using locally available food products could improve nutrition for pregnant and lactating women.⁽¹⁴⁰⁾ For instance, in the local Zulu communities it is felt by some health workers and local tribal authorities that not sufficient use is made of the good protein content of the bean, which can readily be grown and previously was grown by many households. Unfortunately, this report did not study in detail the home produce of foods.

Women remain the providers of 60-80% of the household food needs in many parts of sub-Saharan Africa. They thus are key actors in ensuring the survival and well-being of children. As discussed above, female education (literacy) is a vital element in improving child survival, however, policies which would enable women to spend more time on food production would also contribute towards enhancing child survival and preventing maternal malnutrition. Some of these policies would necessarily include⁽¹³⁵⁾:-

- a. providing safe, potable water for drinking and for growing vegetables and thus cutting down on the enormous amount of

time many women spend each day simply collecting water. The results of this study showed that 83% lived further than 200 metres from the water supply. This perhaps compares favourably with many developing areas but is still a burden for the "water-collector",

- b. Include women in the farmer training programmes and extension services. At this point, women are being trained to a limited extent in KwaZulu and in fact in the Bomela area the large communal garden is solely managed by women,
- c. Appropriate labour-saving technologies adapted for and acceptable to women will reduce the drudgery of the work involved in food production,
- d. Special attention should be paid to the health needs of female adolescents and lactating women. Women's nutritional status is affected by work load, seasonal peaks in labour demand and pregnancy.

Thus essential needs would be, easy access to PHC services, using women's organisations as entry points for PHC (including family planning), encouraging self-help groups e.g. Valley Trust (Botha's Hill) has developed a number of women's self-help groups which have over a number of years been able to develop themselves into a type of "small-business" (personal communication with Valley Trust

Staff), and establishing and strengthening informal child-care (creches) in the community, which permits women to work at certain times of the day. Bomela community has a creche catering for this need - as do many other local communities in the area - supervised by a community based self-help organisation called Ziphakamise, and the endeavours of well motivated nurses.

There is evidence (as discussed above) of an association between malnutrition of pregnant women and LBW of their infants. Supplementation of caloric intake during pregnancy does increase the weight of the infant at birth⁽¹³⁵⁾ and this would suggest that measures to improve nutrition of the foetus, and thus birth weight, might be more effective in reducing infant mortality and less costly than providing the intensive medical care needed for those many underweight and premature babies born to undernourished women. It has been stated that "as a component of prenatal care programmes, it (female nutrition supplementation) is rivalled in effectiveness by only one other measure, namely the provision of tetanus immunisation to women in populations where neonatal tetanus is common..... It has been shown to be the single most cost-effective way of reducing mortality in the prenatal period..... The intervention is relatively simple and inexpensive.....".⁽¹⁴⁶⁾

On the other hand it has been more difficult to demonstrate the value of supplementary feeding programmes for childhood malnutrition. High-protein food supplements for malnourished

children are often a major and costly component of health care programmes. In recent years such schemes have virtually been stopped in the Bomela (and other KwaZulu) communities except where motivation is strong by health workers. However "clear evidence of reduction of morbidity and mortality due to supplementation is not abundant..... maternal education is a critical component of most feeding programmes".⁽¹⁴⁷⁾

Nevertheless, it is difficult to conceive how a mother can adequately feed 3 to 4 children whilst earning R100/month, even if she is obtaining all the necessary health/nutrition education she requires. The question can be posed - does poverty cause malnutrition? or does poor education/knowledge cause malnutrition? A complex issue which this study cannot debate.

Before concluding this discussion on Food Supplementation, in which the nutrition of the pregnant mother has been emphasised, it would be appropriate to end by quoting HUTTEN,⁽¹⁴⁸⁾ editor of the British Journal of Obstetrics and Gynaecology, who wrote, "The subject of nutrition embraces everything from population statistics to the subtle activities of intercellular enzymes. Information throughout that range is particularly thin and fragmentary in pregnancy". He also stated that although large-scale statistics indicate that women in prosperous circumstances have bigger babies and have fewer perinatal deaths than underprivileged women, the interpretation and explanation of these differences is complicated by the fact that

nutritional variables never operate in isolation i.e. social contexts etc. are important. To add further fuel to this debate, it should be noted that several studies amongst underprivileged communities demonstrated that significant falls in maternal and infant mortality were noted using non-nutritional measures.⁽¹⁴⁹⁾ It is obvious thus that efforts must be made to learn the effects of food supplements on the clinical or other benefits to the well-being of mother and child.

WATER SUPPLIES

One of the 12 global indicators to be used for monitoring and evaluation of the Global Strategy of "Health for All by the Year 2000" (HFA 2000) was that safe water should be in the home or within 15 minutes walking distance of the home.⁽¹⁵⁰⁾ In this WHO publication it was stated that a sufficient volume of water for drinking purposes and for keeping the house and its immediate surroundings clean is important. Another important aspect with regard to supply of water is the quality of drinking-water. Quality being defined by the WHO,⁽¹⁵¹⁾ as that which is suitable for human consumption and for all usual domestic purposes, including personal hygiene. In this article it was stressed that in developing national drinking-water standards based on the WHO guidelines it would be necessary to take account of a variety of local geographical, socio-economic, dietary and industrial conditions. In the WHO guidelines given for unpiped supplies (such as pertains in the Bomela area surveyed), it was recommended that Bacteriologically - No faecal coliforms per 100 mls should be found and 10 coliform organisms per 100 mls was acceptable.

The provision of safe drinking-water is a priority element of PHC which is the basis of the strategy for HFA 2000. It is the responsibility of Government, Private organisations and local communities, to be aware of the paramount importance of this

element and to do all within their power to facilitate its implementation. In the Bomela community when the survey was conducted (July-September 1987) there were in existence 2 boreholes and 2 "protected" springs. The boreholes were funded by the community with co-ordination from Dr. T.P. Gilpin (Murchison Hospital) playing a major role in the supply of these structures. The spring protection scheme is being carried out by the KwaZulu Government with community support - and at present there are 6 "protected" springs (Feb.'89 - personal communication with nursing staff at clinic). Unfortunately one of the boreholes is non-functional due to mechanical failure of the pump and as yet the community has not raised the funds for its repair. Rains have been good in the area and springs are often closer to the homes. The results of the study show that 63% use springs as a source of water, 27% use streams and 8% use Boreholes. The concept of "spring protection" may be a better long term solution to the water problems of communities where rainfall is adequate and springs numerous. An important pre-requisite is that the springs should not "dry up" for periods in dry months.

The key role of water, sanitation, sewerage and housing was stressed at a conference hosted by the Medical Research Council (RSA) in 1987 - entitled "Community-based essential health care services in Southern Africa".⁽¹⁵²⁾ In this seminar it was noted that the National Health Services Facilities Plan of the Department of National Health and Population Development, makes provision at the

first level for the provision of these basic needs. It remains to be seen how the implementation will take place to local communities in need. If people are to enjoy good health, the prime prerequisite is that they should live in an environment conducive to this state - among the elements of such an environment are those mentioned already, namely - safe food and water, proper sanitation, adequate housing and freedom from environmental pollution. The objective of the International Drinking Water Supply and Sanitation Decade (ending this year!) was to make available to all people the provision of safe water and sanitation. This will not be achieved but considerable progress has been made.⁽¹⁵³⁾ Again, it must be stressed that the mere provision of facilities does not guarantee improved health. People have to be taught their proper use. (Witness the broken borehole pump at Bomela).

It is said, that a large proportion (over 70%) of the developing population is still struggling to free itself from illnesses associated with squalor, poor hygiene and poverty. The persistence of these diseases indicates the relative ineffectiveness of medical intervention and the diseases thus, must be tackled at source.^(153,154) It has been stated that in "underdeveloped communities the most widespread diseases.... are those transmitted by human faeces.... and.... these diseases spread most easily in areas without a community water supply system".⁽¹⁵⁵⁾ A study amongst the 50 poorest nations in the world showed that only 4 countries were in a position where more than 40% of their population had access to safe

water - the figure was even lower in rural areas.⁽¹⁵⁵⁾ The Bomela survey demonstrated that 90% used streams and springs as main source of water and although the study did not test the quality of water sources it must be borne in mind that of the numerous springs (over 20 known to the interviewers) only six are at present protected.

In Cuba in 1958 only 35% of the total population was estimated to be served by a piped water system - and this figure dropped to 2% for rural areas. By 1969 it was stated that 60% of the rural population were supplied by piped water systems. It is interesting that subsequent to this increase in piped water supply (and a sewerage system) that the gastro-enteritis mortality figures fell from 58,1 per 100 000 in 1962 to 9,7 per 100 000 in 1973 and the incidence of poliomyelitis declined sharply. A similar trend was noted in China.⁽¹⁵⁶⁾

In conclusion, many planners and health workers neglect water and sanitation requirements on the basis that they are costly and the cost always seems high to politicians. However, various studies have demonstrated a contrary finding.^(157,158) The health benefits of water supply and sanitation should be examined from the viewpoint of cost-effectiveness of water-supply and sanitation programmes. It was argued that in view of the relatively high effectiveness of water-supply and sanitation programmes in reducing diarrhoeal diseases alone.... their cost-effectiveness is usually

underestimated.⁽¹⁵⁸⁾

The impact of water supply and sanitation on water-related diseases depends on the quality and quantity of water supply and sanitation, the proportion of the population covered, and the utilization of the water and sanitation facilities available to the population. Socio-economic development is an important factor for the success of water supply and sanitation programmes and for achieving health benefits. Economic sanctions and the calls for improved supplies are not compatible and a measure of responsibility must be borne by those advocating these policies should the first level of the National Health Facilities Plan not be able to be fully implemented.

In view of the expense, to a relatively poor community, and subsequent failure (broken pumps) experienced at Bomela, perhaps the more viable immediate option for the community is to continue with the "spring protection" scheme and to concentrate efforts on protecting as large a number of these springs used as possible in the immediate future, especially those springs which do not "dry up" in winter (dry season).

When discussing water and sanitation (in rural communities) attention can be drawn to an interesting theory - "threshold-saturation theory" which relates health status to socio-economic level, and holds that there is a "threshold" of socio-economic and

health status below which no health benefits can be achieved by investing in water and sanitation (Shuval).⁽¹⁵⁸⁾ How far this is true in reality remains to be tested, but once again it draws one's attention to the overriding importance of community upliftment/development to PHC and health improvement - including the importance of health education.

Whilst conducting the survey it was interesting to note that many of the houses are situated at the top of plateaus or hills above the valleys - where the streams and springs are so often located i.e. houses are often poorly sited with regard to water source. The reason given by the local inhabitants for this was ease of access to roads. However, it should be borne in mind that it is the women and girls who carry the daily water supplies and not the men - and yet it is the men who decide on the siting of the houses. If one considers that the goal set by the UN. Water and Sanitation Decade (1981-1990) was for every person to have reasonable access to 50 litres/day (a normal bath uses 80 litres), it lets one see the problems women are faced with in rural communities e.g. for a household of 6 persons at least 300 litres would be carried - not a small feat by any standards.

A study in Lesotho showed that 50% of the population were using 10 litres per person per day.⁽¹⁶⁰⁾ This study also demonstrated that 20% of the households interviewed used a source of water less than 100 metres from the house and a further 41,5% used a source between

100-500 metres. One must compare this with the UN Water Conference Criterion for urban areas of reasonable access being within 200 metres of a public standpipe.⁽¹⁵⁹⁾ Thus it would appear that at least 60% of the population of Bomela do not have reasonable access to drinking water, according to U.N. standards (FIGURE 9).

SANITATION

In 1983, it was stated "It is not an exaggeration to state that the hygienic disposal of excreta for the millions of villagers in the world is one of the greatest challenges facing public health workers" (Cairncross and Feachem 1983).⁽¹⁶¹⁾ It is estimated that up to 80% of ill health in developing countries is linked to inadequate sanitation and is associated with the prevalence of over 50 different diseases. Nearly 2 billion people in the world today have no or inadequate sanitation facilities ⁽¹⁶¹⁾. The results of this study showed that in the Bomela community 61% of household had access to a pit latrine. This does not indicate the quality of the structure or the siting of the structure in relation to water supplies. Also, even more importantly, the results do not give any indication of the degree of utilization of the latrines. It must be remembered that inadequately constructed pit latrines in themselves create health hazards through becoming a vehicle for fly and mosquito breeding. Inadequate sanitation is a chief source of infection in the spread of many infectious diseases.⁽¹⁶¹⁾

It should also be remembered that sanitation and water are very closely linked and it is difficult, if not impossible, to plan a programme in an area and to determine which should receive priority - where resources for both are inadequate. In any programme designed to improve water and sanitation facilities in a local

community there are no simple guidelines. Great flexibility in approach is necessary because of vastly different cultures, attitudes, habits, economic conditions, and political ideologies.⁽¹⁵⁷⁾ Attempts to improve environments of poverty have often been unsuccessful because they are based on the increasing role of central governments, which too often are not inclined to work with the people. Even the United Nations has become too large, too complex, too slow and too closely linked to governments to have proved effective in many sanitation programmes.⁽¹⁶²⁾ Communities themselves must participate in planning and implementation of programmes, using appropriate health education (for health workers and community members). The mere provision of facilities does not guarantee improved health. People have to be taught their proper use.

A study conducted by the World Bank which analyzed data related to disease in underdeveloped communities came up with the following formula⁽¹⁵⁵⁾:-

$D = F(W, S, H, E, N, Sx, Hf)$ where,

D = Disease of an individual or family

W = Water

S = Sanitation

H = Housing

E = Education

N = Nutrition

S_x = Sex differences

H_f = access to health facilities.

The study demonstrated that a large percentage of diseases in underdeveloped countries are derived from socio-economic conditions.

Lack of sanitation, we know, is linked to many infectious diseases. However, in poor rural (and peri-urban) communities the cost of building an adequate latrine may amount to as much as 2-3 times the breadwinners monthly income and in poverty situations this may not be seen as a priority.⁽¹⁶¹⁾

It will be very difficult to demonstrate the direct effect of adequate sanitation on reduction of waterborne infectious diseases, as water source, economic conditions and educational levels have all shown to be inter-linked. However this should not deter PHC workers, local authorities and central governments in their efforts to supply adequate sanitation facilities and to ensure their proper use by appropriate health education of the communities involved. The whole GOBI-FFF strategy must be linked with water, sanitation and housing and the general economic upliftment of communities.

In concluding, it should be remembered that lack of sanitary facilities is often caused by poverty, but that the provision of such facilities, especially from external sources, does not

guarantee that they will be used nor that they will generate health benefits. A study in India found that children under 18 months of age were not very much affected by sanitation-related variables but older children (up to age 3) benefited most from their own and their parents sanitary habits and children over age 3 benefit readily from sanitary habits.⁽¹⁶³⁾

With no apology for repeating a previous assertion - "numerous studies have shown that properly planned and implemented water-supply and sanitation projects have improved health status and eliminated or controlled water-related and/or sanitation-related diseases. Water supply and sanitation have also proved a cost-effective strategy in the control of enteric and diarrhoeal diseases in particular".⁽¹⁵⁸⁾

It is difficult with limited resources, to make the choice between sanitation facilities and water supplies. Both are important and both sorely needed in most rural areas - including Bomela. But both depend for success on community involvement in planning and implementation through appropriate education.

In an area adjacent to Bomela the local Chief has introduced a system of inspecting households and fining those who do not have a toilet facility. This system has some merits, but education and support may be a better long term solution to the sanitation problem.

In view of the fact that 91% of the community are dependent on surface water supplies (spring/streams) it is a rather disturbing feature that only 62% of households surveyed have a pit latrine available - and one wonders how many of these are actually used - as faeces and urine disposal on open ground must inevitably contaminate surface water.

CROWDING INDEX AND DENSITY PER ROOM (SLEEPING)

A WHO expert committee on Public health aspects of Housing published their findings (in 1961) on which characteristics would constitute "the fundamentals of a healthful residential environment".^(164, 165) As well as including adequate good quality/quantity of water, suitable sanitation etc, it was stated that each dwelling unit should be safe and structurally sound with "a sufficient number of rooms.... to avoid overcrowding of living or sleeping rooms.... at least a minimum degree of privacy.... suitable separation of rooms providing separate bedrooms for adolescent and adult members of opposite sex except husband and wife.... and adequate ventilation and illumination". This list is totally unrealistic for the majority of rural people in the world - including the Bomela community where as can be seen from the results the average density of people sleeping per room was 3. A study in the Cape (Mamre) showed that 33% of households had 3 or more people sleeping per room.⁽¹⁶⁶⁾ This figure included mixed sexes and ages for many households. What these conditions do for a community's social and psychological health must be harmful and yet so often housing aspects are neglected at the expense of water and sanitation. Yet overcrowding in itself can make the problems of sanitation and water supply worse.

There is an association between overcrowding and susceptibility to specific diseases (e.g. TB, measles and Rheumatic Heart Disease)

but it is difficult to prove a causal relationship as so many other social and economic factors are associated with the conditions which lead to the overcrowding.⁽¹⁶⁴⁾

The problem of overcrowding is not, however, confined to rural communities and is becoming a major problem wherever rapid urbanisation is occurring. As increasing "progress" and "development" takes place in the Developing World a great deal of displacement from the land occurs and the urban areas of most developing countries (e.g. Durban) have grown to sizes which can ultimately signal chaos and decay. "Employment and housing are probably the most seriously affected sectors in the urban economy".⁽¹⁵⁵⁾ Substandard and congested houses, lacking basic water and sewerage facilities become homes for larger and larger numbers of people. Disease infested inhabitants (e.g. PTB, measles) share the same room with healthy people and create additional health hazards - especially with regard to airborne diseases.

In concluding this brief discussion on "crowding index" of housing let it not be forgotten, that as well as the physical airborne diseases which are at risk of increased transmission there is the problem of adolescents of different sexes (of necessity) sharing the same room for sleeping in and of 8-9 year old children (and maybe older) sharing the private/intimate relationships of husbands and wives - surely a situation not conducive to good psychosocial development of communities?

UTILIZATION OF HEALTH CARE RESOURCES

One of the indicators used by WHO to monitor and evaluate progress towards the attainment of "HFA 2000"⁽³⁾ is the provision of health care which includes:- availability, physical accessibility, economic and cultural accessibility, utilization of services and quality of care.

As was stated at the commencement of the study - all household surveyed in this study were within 4 kilometres of the Bomela clinic. This clinic is staffed by 2 (3 since 1988) professional nurses with midwifery training and a state enrolled nurse. There is a 24-hour service available for emergency and maternity cases. The clinic is situated 400-500 metres from a public bus stop - along which buses travel at least every hour as well as the well known "Combi" taxi services being available. The fee for attendance at the clinic for whatever reason is R2 (two Rand) except for immunisation and well baby services which are free and TB services are also free. Why then do 27% choose to initially spend four or five rand (transport) to attend hospital and even more money to attend local "isangomas" (traditional healers) and private general practitioners?

Each household surveyed was within a maximum of one hour walking or transport time to the clinic. This is within WHO recommended

access time.⁽¹⁶⁸⁾ What then are the barriers to utilisation of existing health resources? The reasons will not be discussed in detail, and those interested may refer to a study done by the researcher on Inpatient Catchment populations for Natal and KwaZulu.⁽¹⁶⁷⁾ A summary of reasons for non-utilisation would be:-

- a. Physical accessibility - not only distance, but terrain to be traversed is important and the accessibility to public transport e.g. it may be closer to the clinic (physically) but closer to transport travelling directly to the hospital.
- b. Economic accessibility - but in this context the clinic fees are cheaper than all the other services studied and selected by households.
- c. Cultural acceptability - tradition may dictate an initial visit to the traditional healer - as indeed occurred on occasions in this survey.
- d. Availability of the service - most clinics only "hold" Antenatal clinic sessions on a particular morning (for obvious administrative reasons) and yet this may not be suitable to the pregnant mother.
- e. Patient satisfaction with the quality and type (comprehensiveness) of service provided is an important factor. The attitudes of health care workers is an important component.^(150,167)

Health planners would be well advised to study utilisation patterns of health facilities and act on the results.

Health workers should become more community orientated as opposed to remaining within the confines of their clinics i.e. take services to the people. An interesting concept operating in KwaZulu is that of "clinic committees". These committees are elected by the community to represent their views on health-related matters to the health workers. The idea is to obtain more community involvement in organising the clinic and health matters. Unfortunately in practise, on the whole, the concept is proving disappointing thus far. As communities develop in the future and become more aware of their roles in committees and community programmes the problems being experienced at present may be overcome.

CONCLUSION OF LITERATURE SURVEY

Primary Health Care (PHC) - of which GOBI-FFF is one component - is the key to achieving an acceptable level of health throughout the world in the foreseeable future as part of social development and social justice. PHC is valid for all countries and communities. There is, at present, widespread disenchantment with health care generally - this is understandable given the technical knowledge available, as the knowledge is not being put to the best advantage for the greatest number of people. Resource allocation in every country is biased towards the urban areas (and often to the least "needy" of these areas).⁽¹⁶⁹⁾ The provision of medical care is being dispensed by growing numbers of specialists, using narrow medical technologies. People have become "cases" and the art of communication is being lost. PHC is a practical approach to making essential health care universally accessible to individuals, families and communities in an acceptable and affordable manner to the local members, with their full participation. PHC means more than the mere extension of basic health services. It has social and developmental dimensions and when properly applied will influence the way in which the rest of the health system functions. The goals of PHC are attained by social means, such as greater responsibility for health by individuals and communities and active participation by them in attaining "HFA-2000". The healthier a community is, the more

likely it will be able to contribute to social and economic development, i.e. PHC and community development should be mutually supportive. Health cannot be attained by the health sector alone. In developing countries, economic development, anti-poverty measures, food production, water, sanitation, housing, environmental protection and education all contribute to health and have as a common goal - human development.

PHC contributes to development by improving health status e.g. Malaria control and sleeping sickness control programmes can open the way for the establishment of new business or residential areas. Good nutrition may increase work productivity. Improved nutritional status and the prevention of infection by immunisations may improve the physical and mental development of the child. A reduction in IMR has been shown to lead to a decrease in the rate of population increase. Thus PHC can be the lever to increase social awareness and initiative.

PHC, however, needs the support of other sectors to achieve its goals:- Agriculture, for food production, job creation and improved nutritional status, education for children and adult literacy programmes, Development Aid/Housing for shelter and socio-economic upliftment, water for people, food production, Public works and communications for roads and the media for educational and information services.

This study in a small way attempted to look at PHC - albeit in a selective way, (mainly at GOBI-FFF) - to assess whether the Primary Care approach (compared to the more comprehensive PHC) of placing peripheral clinics near a community i.e. nurse-orientated clinics is helping to achieve the goal of "HFA-2000". The results have been displayed and commented upon. The challenge remains and it is our responsibility to continue to strive to improve the quality of life of all individuals - given the problems of politics, finances, sanctions etc. - and to try to achieve in whatever way we can, as health workers, the objectives of PHC as stated at ALMA-ATA.⁽²⁾

People may debate the issues of "selective" PHC e.g. GOBI-FFF against "comprehensive" PHC i.e. social/political "developments"⁽¹⁷⁰⁾ but the fact remains that the present is the reality for those poor in rural, peri-urban and urban areas and surely it is one's responsibility to act for the present as well as the future.

RESULTS

OBJECTIVE I

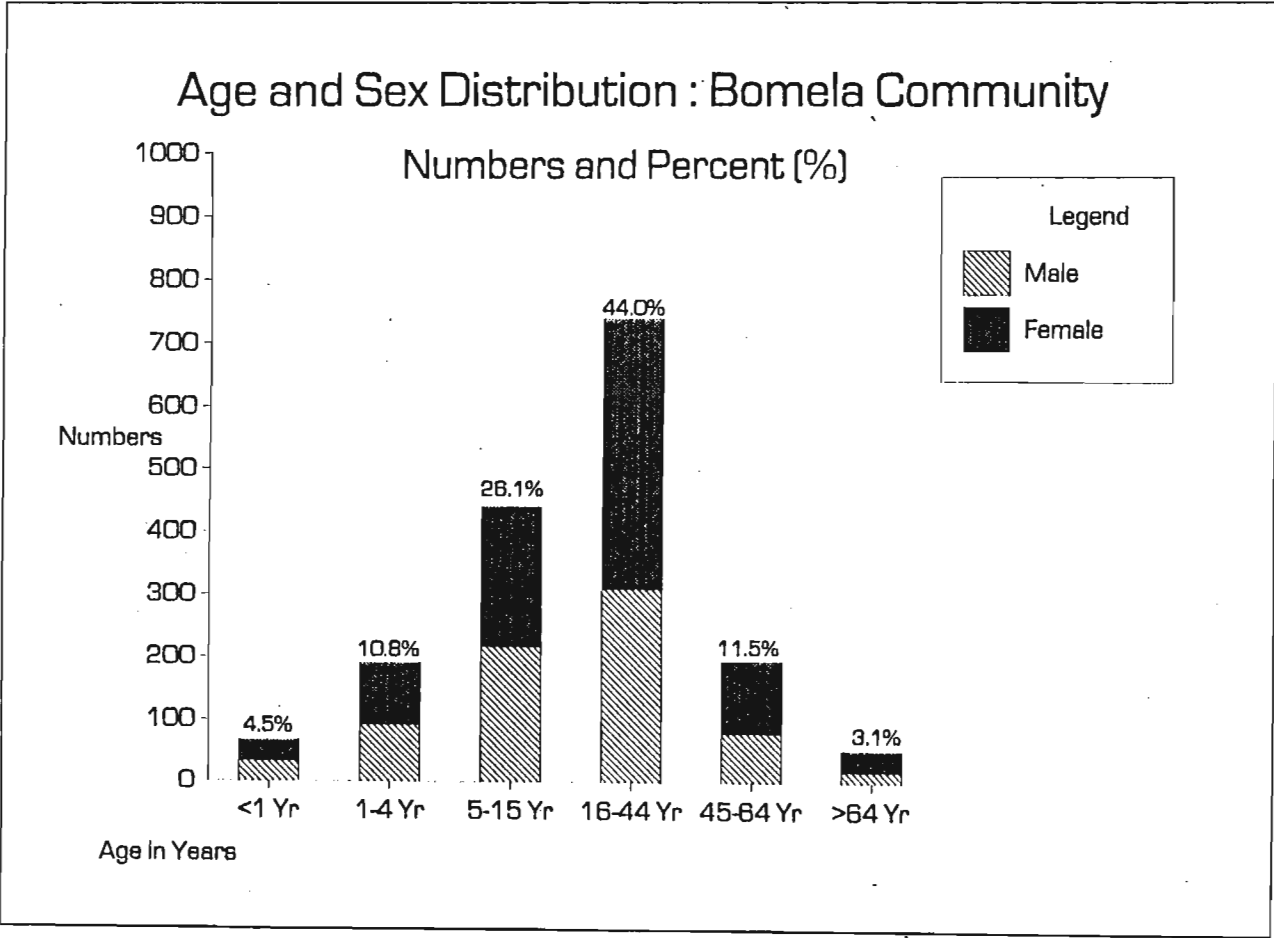
THE SIZE, AGE AND SEX STRUCTURE OF THE RESIDENT POPULATION OF BOMELA

The number of residents living in the 200 households interviewed was 1 682 (TABLE 1, FIGURE 1). The sample was estimated to contain 11% of the households (200 out of 1 798) as enumerated from the aerial photograph, and this would imply that the community studied has approximately 15 000 residents. RSA Census figures for 1985 were of no value to the study as the Bomela community was included in the total count for Izingolweni Magisterial district and Bomela was a part of one of the enumerator sub-districts. These approximately 15 000 residents are the section of the Bomela clinic catchment population who are referred to Murchison Hospital should referral prove necessary by the clinic staff. The remainder of the Bomela community being referred to the Port Shepstone Provincial Hospital.

A total of 257 (15%) were under the age of 5 years, of whom 125 (49%) were Males (TABLE 1, FIGURE 1). The number in the age group 5-15 years was 440 (26%) of whom 216 (49%) were males. Six hundred

and ninety seven (41%) residents were less than 16 years of age in the community studied - a figure comparable with those of other developing communities.

FIGURE 1



The age group 16-44 years included 740 (44%) people of whom 309 (42%) were males (TABLE 1, FIGURE 1). The difference noted in the Male to Female ratio (2:3) at this age is likely to be associated with the migration of males to urban areas in search of employment.

One hundred and ninety three people were aged between 45-64 years, representing 11% of the total population, of whom 80 (41%) were males (TABLE 1, FIGURE 1). This compares with circumstances, in developing communities as distinct from "developed" communities where this age group may represent up to 20% of the total population.

Those people aged 65 years or older, of whom 18 (35%) were males, accounted for 52(3%) of the population, (TABLE 1, FIGURE 1). This low percentage of people aged over 64 years is typical of developing communities, where life expectancy is lower than in developed communities.

The percentage of males and females, for the community as a whole, was 45% and 55% respectively, (TABLE 2, FIGURE 1).

OBJECTIVE 2

SOCIO-ECONOMIC STATUS AND ENVIRONMENTAL CIRCUMSTANCES

A. Economic Activity

Of the 1 682 people about whom information was obtained in the study, 313 (19%) were less than 6 years of age (6 years being the official age at which children should commence school) (TABLE 2, FIGURE 2).

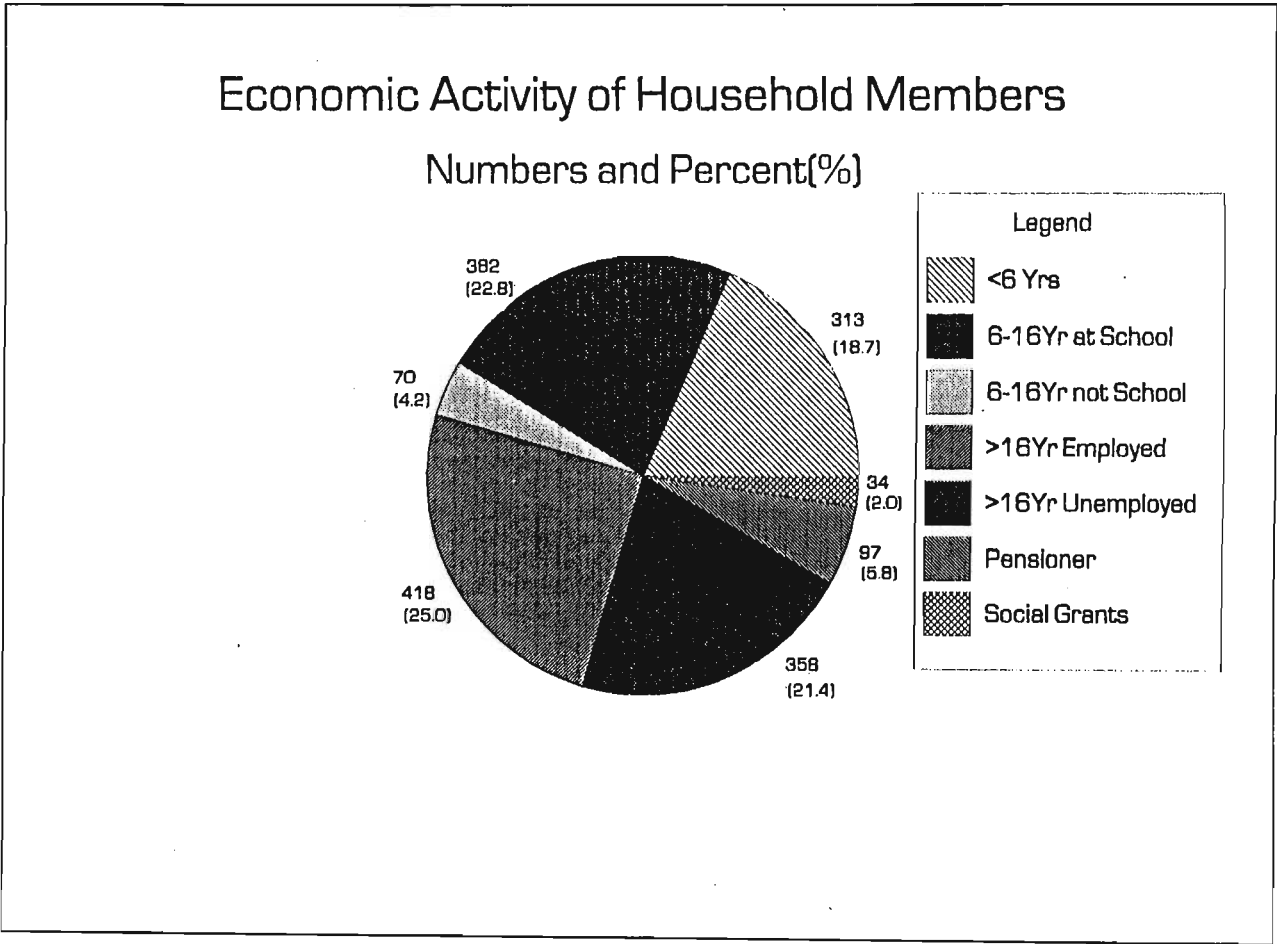
There were 452 (27% of total population) children aged between 6-16 years who were eligible to attend school. Of this number, 382 (85%) were school pupils. It is interesting to note that 38 (17%) boys compared to 32 (14%) girls in this age group were not attending school which, although not statistically significant, is often not the pattern seen in other developing communities throughout the world. (TABLE 2, FIGURE 2).

The age group in the community who should have been attending school, assuming that the minimum school leaving age should be 17 years, represented 452 (27%) of the total population of 1682 (TABLE 2, FIGURE 2).

The unemployed group (aged 16-64 years) represented 21% of the total population [358 out of 1 682] (TABLE 2, FIGURE 3).

Ninety eight (30%) males and 260 (58%) females aged over 16 years and not in receipt of a disability grant, were unemployed (TABLE 2).

FIGURE 2



Persons in receipt of "old age" pensions represented 61 (4%) of the total population and ninety seven (6%) were eligible, indicating that 63% of eligible pensioners are in receipt of their pensions (TABLE 2, FIGURE 2).

People in receipt of single care grants and disability grants (social grants) totalled 34 (2%) of the population (TABLE 2, FIGURES 2). From the information collected one was unable to determine the percentage of eligible recipients.

The dependency rate for the Bomela community (0-15 years + greater than 64 years + Disabled / 16-64 years) is estimated to be 49% (825 out of 1 682) (TABLES 1 AND 2). This estimate does not take into account those unemployed in the age group 16-64 years. No attempt was made to assess the desire of those who were unemployed to gain employment. This is a limitation of this study.

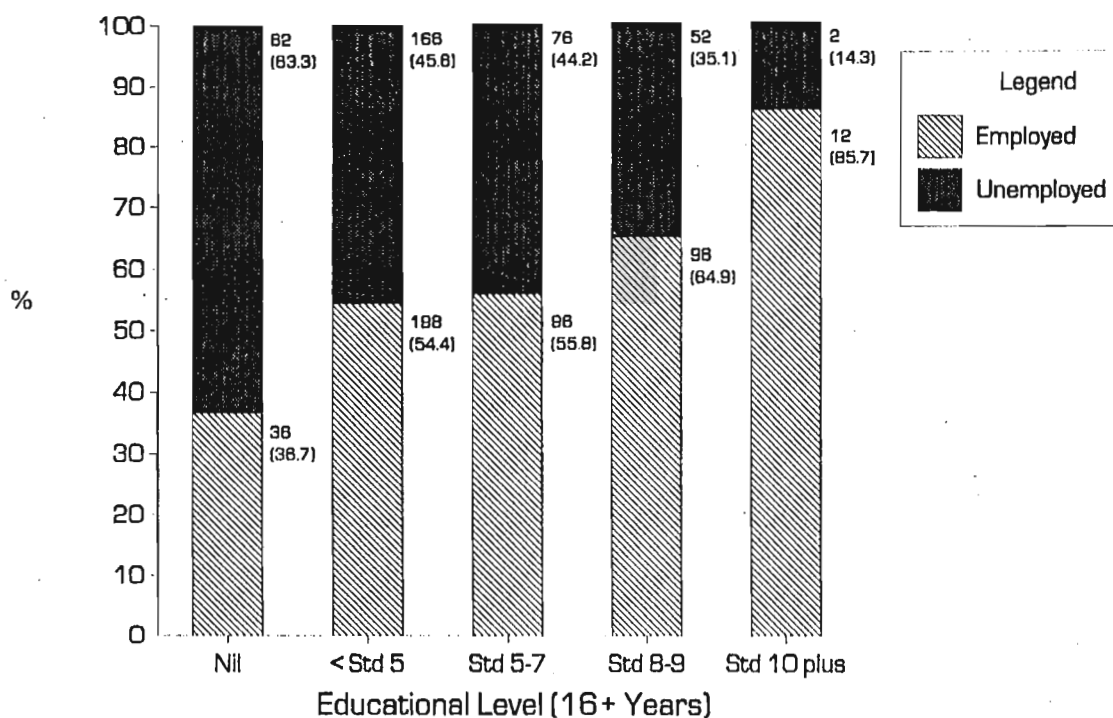
This high dependency rate, especially with regard to those less than 6 years of age, is noteworthy within the contexts of priority determination and resource allocation for the Bomela area e.g. Paediatric Primary Care and Family Planning and Maternal Health.

B. Association between employment and level of education

Those aged 17 - 64 years who may be considered to be employable numbered 776 (46%) (TABLE 3, FIGURE 2). Three hundred and fifty eight (46%) of these people were unemployed. Of the unemployed group, 62 (17%) had received no formal education, 166 (46%) had less than standard (STD) 5 education, 76 (21%) had STD 5-7 education and 54 (15%) had greater than Std 8 education (TABLE 3, FIGURE 3). In summary, of the 358 unemployed people, 228 (64%) had less than STD 5 education. Unemployment and low educational status were significantly associated, $\chi^2_1 = 20,09$ ($p < 0,01$).

FIGURE 3

**Employment Status according to Educational Level
Numbers and Percent(%)**



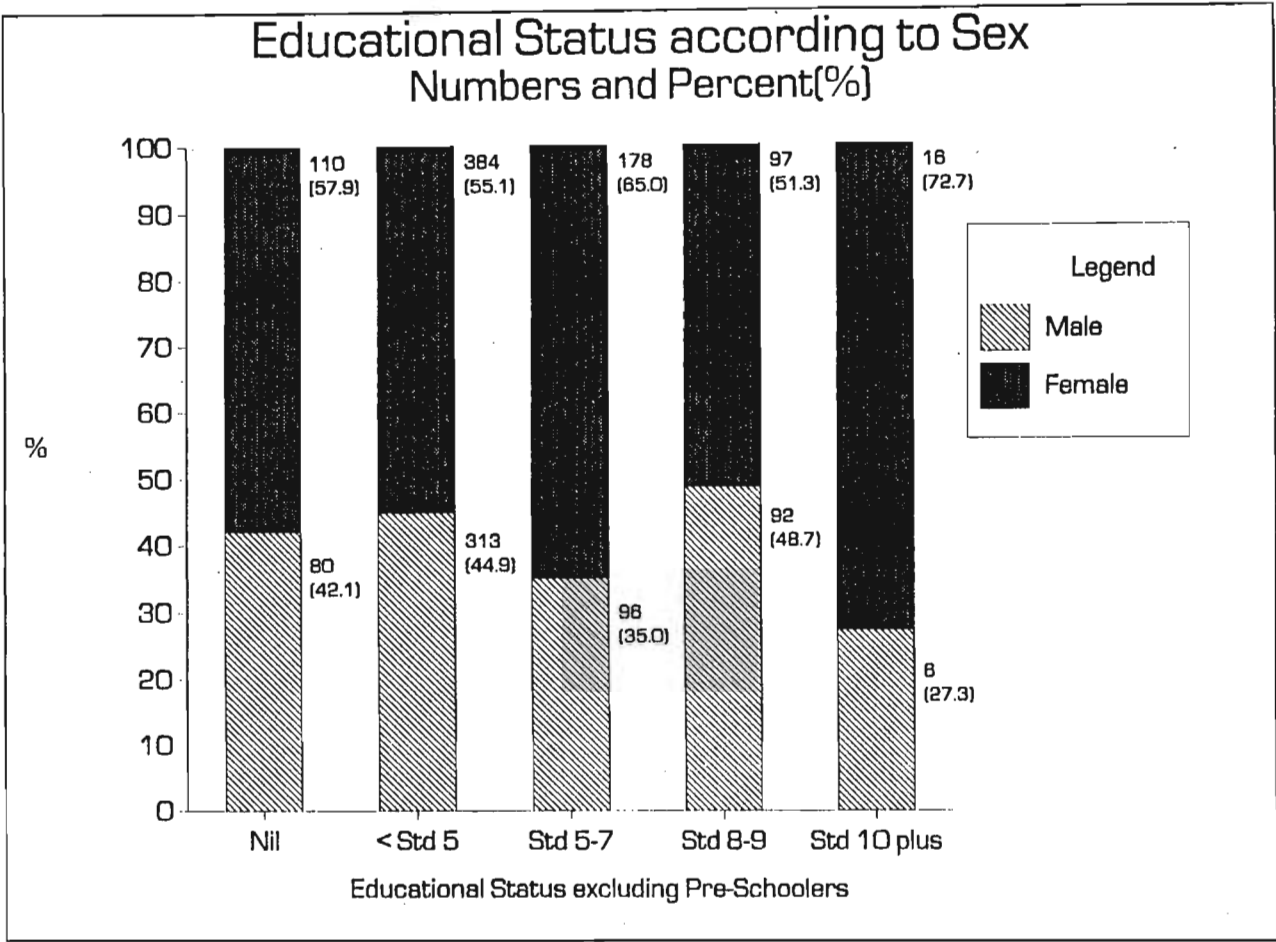
C. Association between Level of Education and Sex

Thirty two (14%) females and 38 (17%) males between the ages of 6-16 years were not attending school (TABLE 2), yielding an overall attendance rate in this age group of 85%.

Of 985 people who were more than 16 years of age (TABLE 3), 211 (24%) had completed a STD 8 or greater education. Of these, 98 (46%) were males (TABLE 4, FIGURE 4).

Ninety eight males (24%) and 113 (18%) females aged more than 16 years had attained standard 8 education (TABLE 4, FIGURE 4). This standard may be higher than that normally used in assessing "literacy" but the 80% of people over 16 years of age with less than standard 8 education is cause for concern.

FIGURE 4



A total of 22 people out of 985 (2%) aged 17 years or more had completed education to matriculation level. Thirteen percent of males and 12% of females over 16 years of age had completed greater than standard 7 education. There is thus a high "fallout" or failure rate between STD 8 to Matric (TABLE 4, FIGURE 4).

In the study sample there was no statistically significant difference between the educational achievement of males and

females. However no account is taken of those who have migrated to urban or other areas in search of employment and therefore any conclusion should be drawn cautiously.

D. Social-Environmental Circumstances

Crowding Index

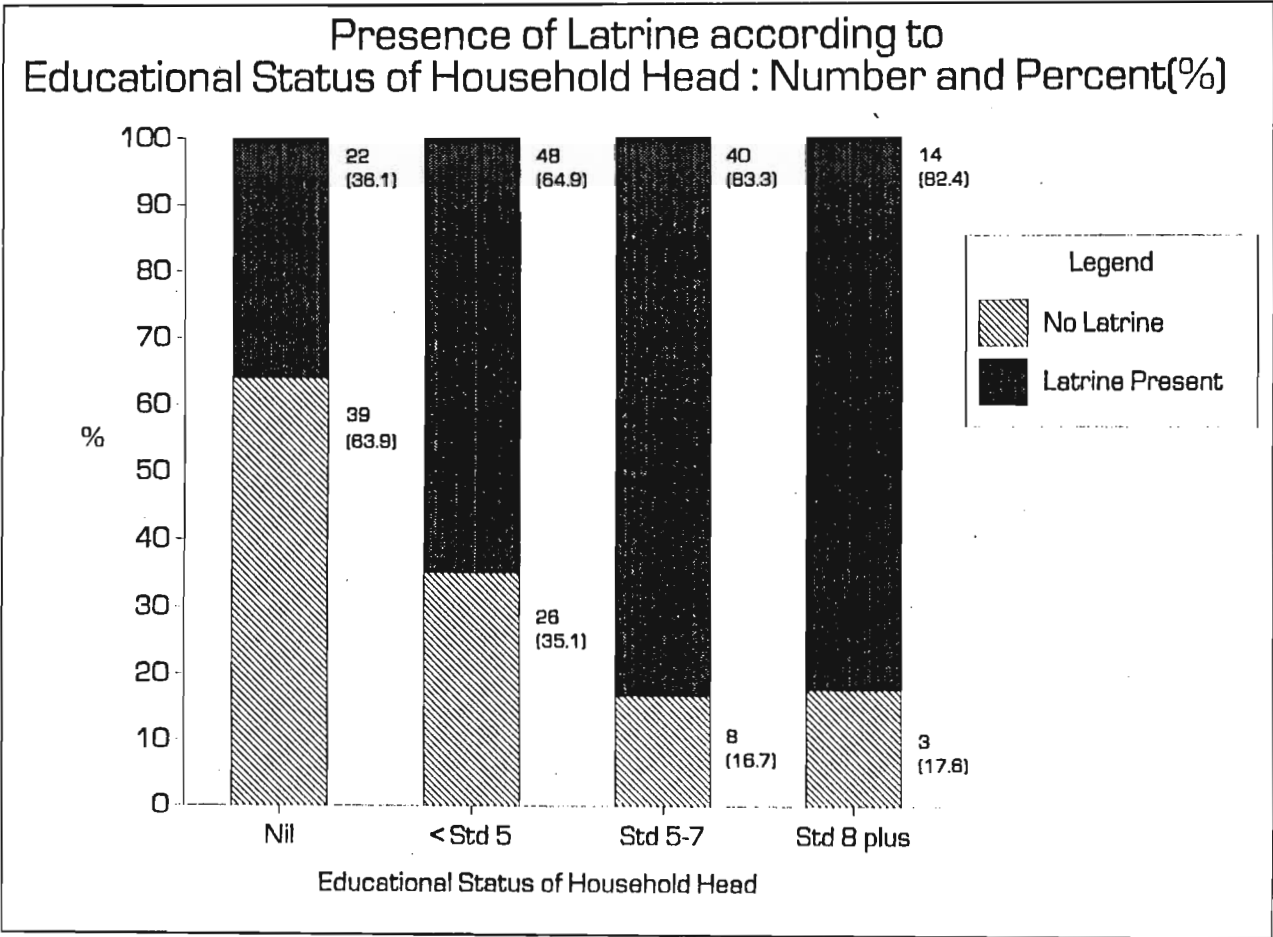
There was an average of 8,4 people per household interviewed. It is important to note, however, that a "household" does not necessarily imply a single family unit. The "crowding index" (number of residents sleeping per room) was 3 (TABLE 5).

E. Household Sanitation

Of the 200 households interviewed, 124 (62%) had access to some form of toilet facility (latrine), the remaining 38% having none.. The degree of utilisation of a toilet facility was not determined, as it was considered that the replies would be subjective and difficult to verify (TABLE 6). The 62% having access to a toilet facility indicated above does not indicate that each household had a toilet, as some household groups claimed to share a single toilet facility. The above figure, therefore represents the "best possible" result for sanitation.

The presence of a toilet facility was significantly associated with the educational standard (>Std 5) of the Head of Household, $\chi^2_1 = 16,34$ ($p < 0,0001$) (TABLE 7, FIGURE 5).

FIGURE 5



F. Means of Refuse Disposal

Of the 200 households, 119 (60%) had access to a pit for refuse disposal and 81 (40%) had no such facility. There was no

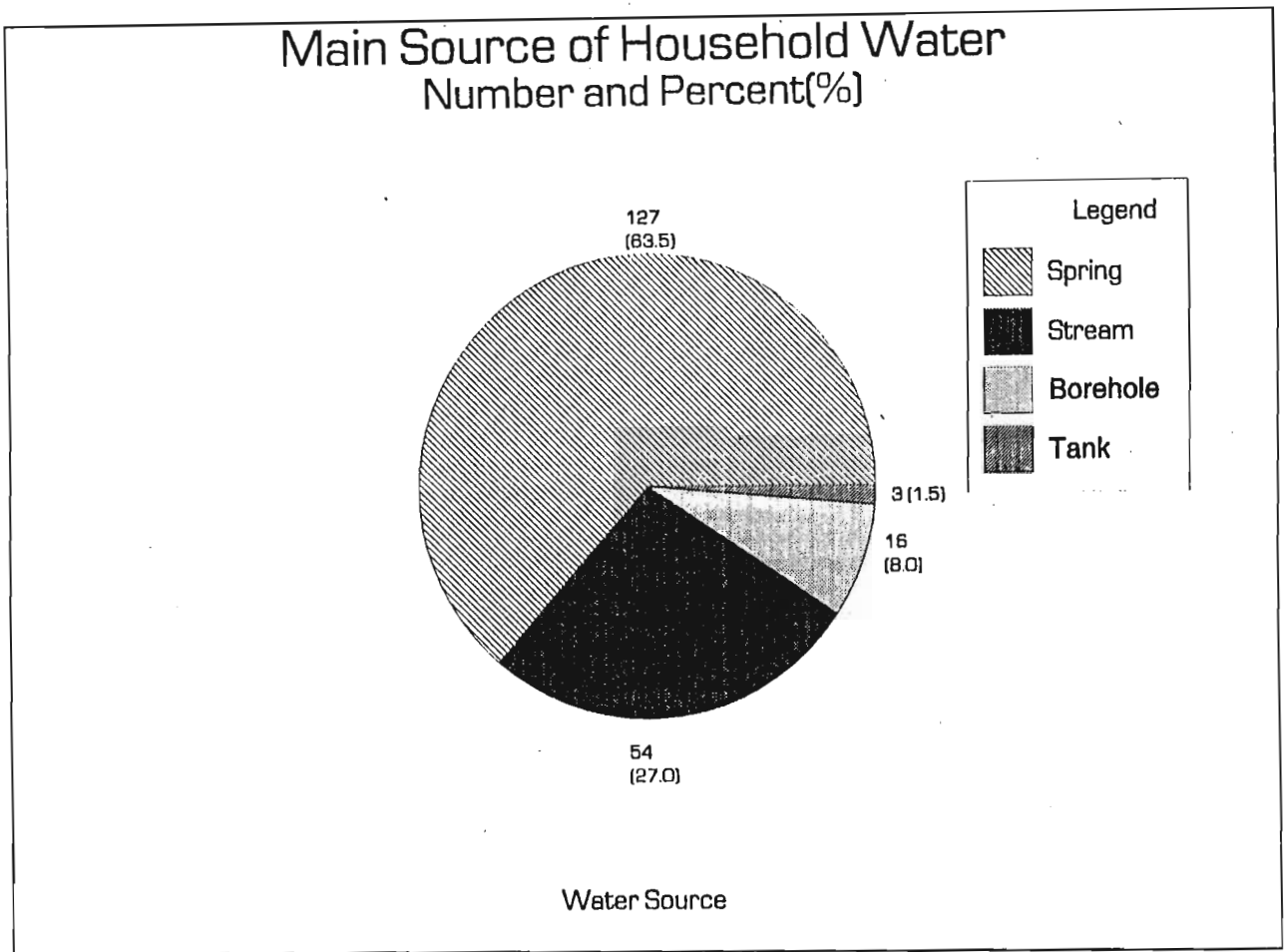
statistically significant association between the presence of a latrine and a refuse disposal facility (TABLE 8).

G. Water - Main Source of Supply

The main source of water for the community was spring water which was used in 127 (64%) households. Six of the springs used were, at the time of the study, "protected", under a programme organised by the KwaZulu Department of Agriculture.

River water was used by 54 (27%) households, while boreholes provided for 16 (8%) of households (there are 2 boreholes in the community, of which 1 was functioning at the time of the study).

Three households reported using rain water from roof run off as the main source of water, but in winter all 3 households had to resort to spring water (TABLE 9, FIGURE 6).

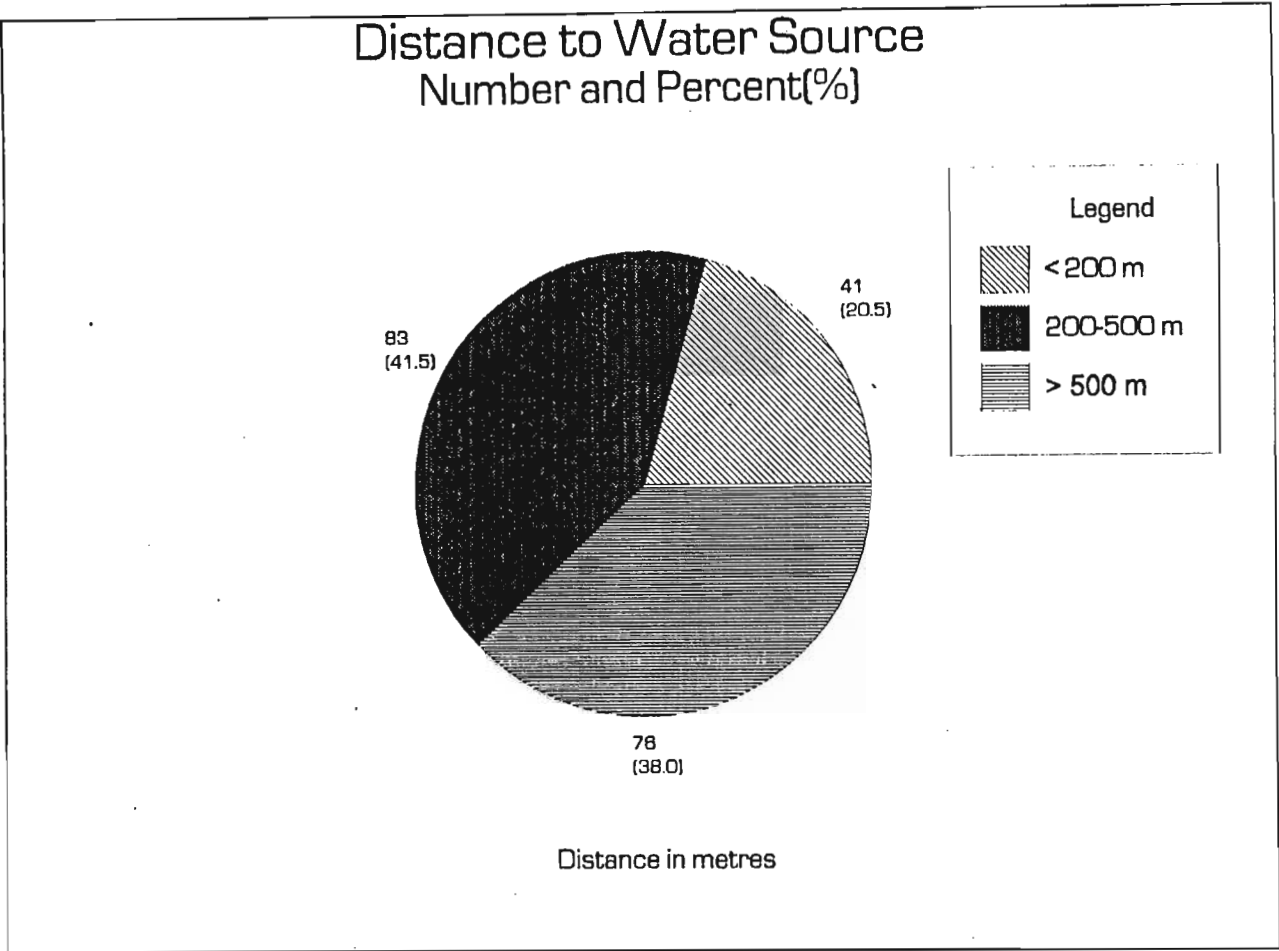
FIGURE 6

H. Water - Distance to Main Source of Supply

The majority of households 83 (42%) reported the main source of water as being between 200 and 500 metres from the household.

Seventy six (38%) households had to travel more than 500 metres to obtain water and 41 (20%) were within 200 metres of a water source (TABLE 10, FIGURE 7).

FIGURE 7



The United Nations has suggested that households should be within 15 minutes walk (single trip) of a water source and thus at least 40% of Bomela people are excluded from this standard - assuming it takes one greater than 30 minutes to walk 500 metres to a water source and return with a full container of water. The true percentage is likely to be higher as the information collected grouped households together who were assessed to be between 200 and 500 metres from a water source.

I. Type of Garden at Household

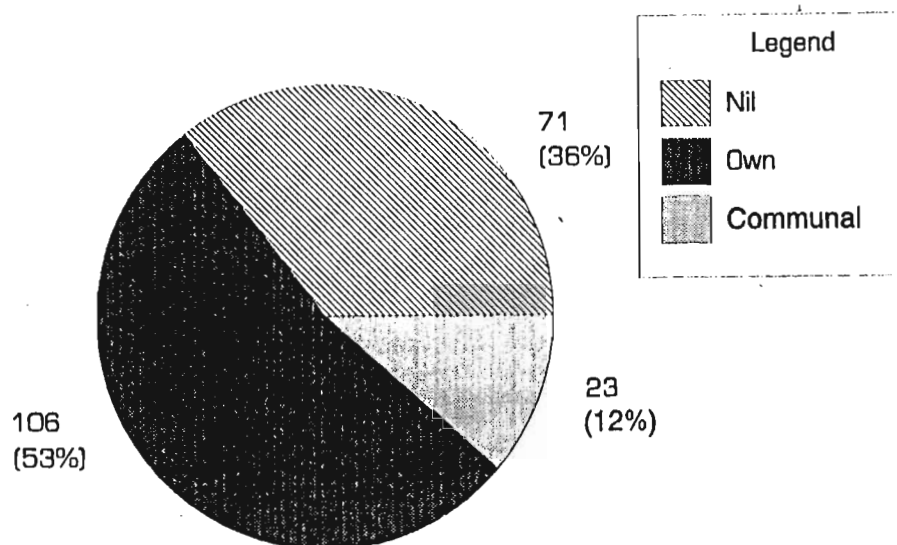
A garden in this study was defined as a site producing at least 2 vegetables or fruit excluding maize.

Results indicate that 106 (53%) households maintained their own garden and 23 (12%) participated in some form of communal (shared) garden scheme. This suggests that 62% were growing fresh produce which, although encouraging, could be improved upon.

Seventy one households (36%) had no garden facility as defined above, although a number of these households grew maize (TABLE 11, FIGURE 8).

FIGURE 8

Presence and Ownership of Vegetable Gardens Numbers and Percent[%]



Type of Garden

It is relevant that in the year since the study was performed (August 1987), at least 2 additional community garden schemes have commenced under the guidance of the KwaZulu Department of Agriculture.

OBJECTIVE 3

MORBIDITY AND MORTALITY INFORMATION FOR CHILDREN

UNDER 5 YEARS OF AGE

A. Episodes of Significant Morbidity in the Previous 6 Months

1. Measles:- Twenty three cases of measles were reported which accounted for 11% of significant morbidity in the population. Of these, 6 (26%) occurred in children under the age of 2 years and 14 (61%) occurred in children under 3 years of age (TABLE 12, FIGURE 9).

The 14 cases of measles reported in those under 3 years of age accounted for 16% of the significant episodes of morbidity in the previous 6 months in this age group (TABLE 12).

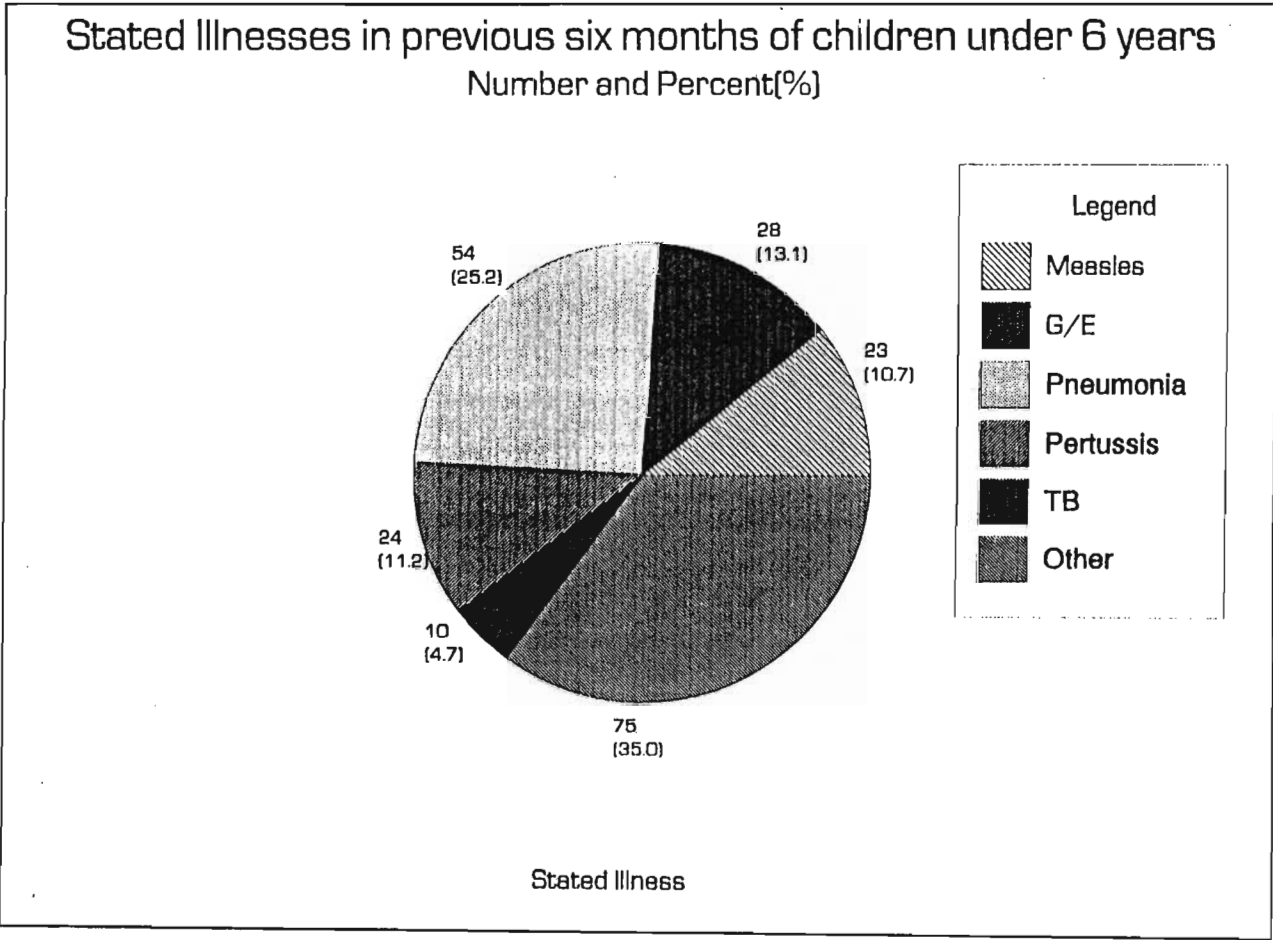
The results indicate that measles continues to be a problem as would be expected if one looks at the estimated immunisation coverage of 30% (assuming that UNKNOWN status implies no immunisation having been received) (TABLE 25).

- II. Gastro-Enteritis (G/E):- Twenty eight cases of G/E were recorded in the previous 6 months, accounting for 13% of

significant morbidity in the children under 6 years, 19 (68%) of which occurred in children under 3 years of age (TABLE 12, FIGURE 9). The reported episodes of G/E were in respect of those cases where the mother sought health care.

G/E accounted for 20% of morbidity in the previous 6 months in children under the age of 3 years (TABLE 12) and therefore remains a health care priority.

FIGURE 9



III. Pneumonia:- Fifty four cases of "significant" pneumonia (see Definitions) were reported, accounting for 25% of morbidity in the previous 6 months in children under 6 years of age. Nineteen of these cases (35%) occurred in children of 2 years and younger. Pneumonia accounted for 15 (35%) cases in those under the age of 2 years (TABLE 12, FIGURE 9).

The number of episodes of pneumonia which occurred may have been even higher as whooping cough (pertussis) appears to have had a relatively high incidence. A proportion of cases diagnosed as whooping cough by mother and clinic staff may have been pneumonia. The converse may however also be true. This is a limitation of the study.

IV. Whooping Cough:- Reported cases of Whooping cough (pertussis) accounted for 24 episodes (11%) of morbidity in the previous 6 months. Sixteen (67%) cases occurred in children less than 3 years of age and 8 (33%) were in children less than 2 years of age (TABLE 12, FIGURE 9).

The problems in distinguishing between pneumonia, pertussis and parapertussis have been noted and in the interpretation of these results should be taken cognisance of. However, pertussis remains a significant problem - the 40% (known) coverage with DWT vaccine for those under 2 years of age is

low - and this matter needs to be addressed (see Literature Survey).

- V. Tuberculosis (TB):- Ten cases of TB were reported in the previous six months in children under 6 years of age, 2 of whom were admitted to hospital for treatment and 8 of whom were treated as "contacts" using ambulatory therapy. No cases of TB meningitis were recorded. Thus TB accounted for 5% of significant morbidity in children under 6 years (TABLE 12, FIGURE 9).

BCG immunisation coverage is estimated to be over 80% (as judged by the presence of a BCG scar on the arm). This figure compares favourably with other areas (see Literature Survey).

- VI. Poliomyelitis:- No cases were reported in the 6 months prior to the study. However, the well publicized epidemic in Natal and KwaZulu (1987/88) did affect the Izingolweni area in which Bomela is situated. Five cases were notified from Murchison Hospital.

At the time of the study the estimated overall complete (3 doses on schedule) coverage for age with poliomyelitis vaccine was 27%, while incomplete coverage for age was found to be 33% (TABLE 26).

During and subsequent to the epidemic of 1987/88 a mass immunisation campaign (using poliomyelitis vaccine Type I) was mounted so that the results of this study are likely to differ markedly from the present immunisation status, as the Bomela clinic was involved in the mass campaign.

VII. Other:- Causes of significant morbidity in those under 6 years of age, other than the conditions discussed above, accounted for 75 (35%) of cases. Forty four (59%) of these incidents occurred in those aged 4 and 5 years and included, trauma, burns, epilepsy and paraffin ingestion (TABLE 12, FIGURE 9).

It is interesting that in children aged 2 years, "other" as a cause of morbidity accounted for 16 (35%) of cases. The majority of these were burns (11) and paraffin ingestion (7) both of which are preventable through education on safety in the home (TABLE 12).

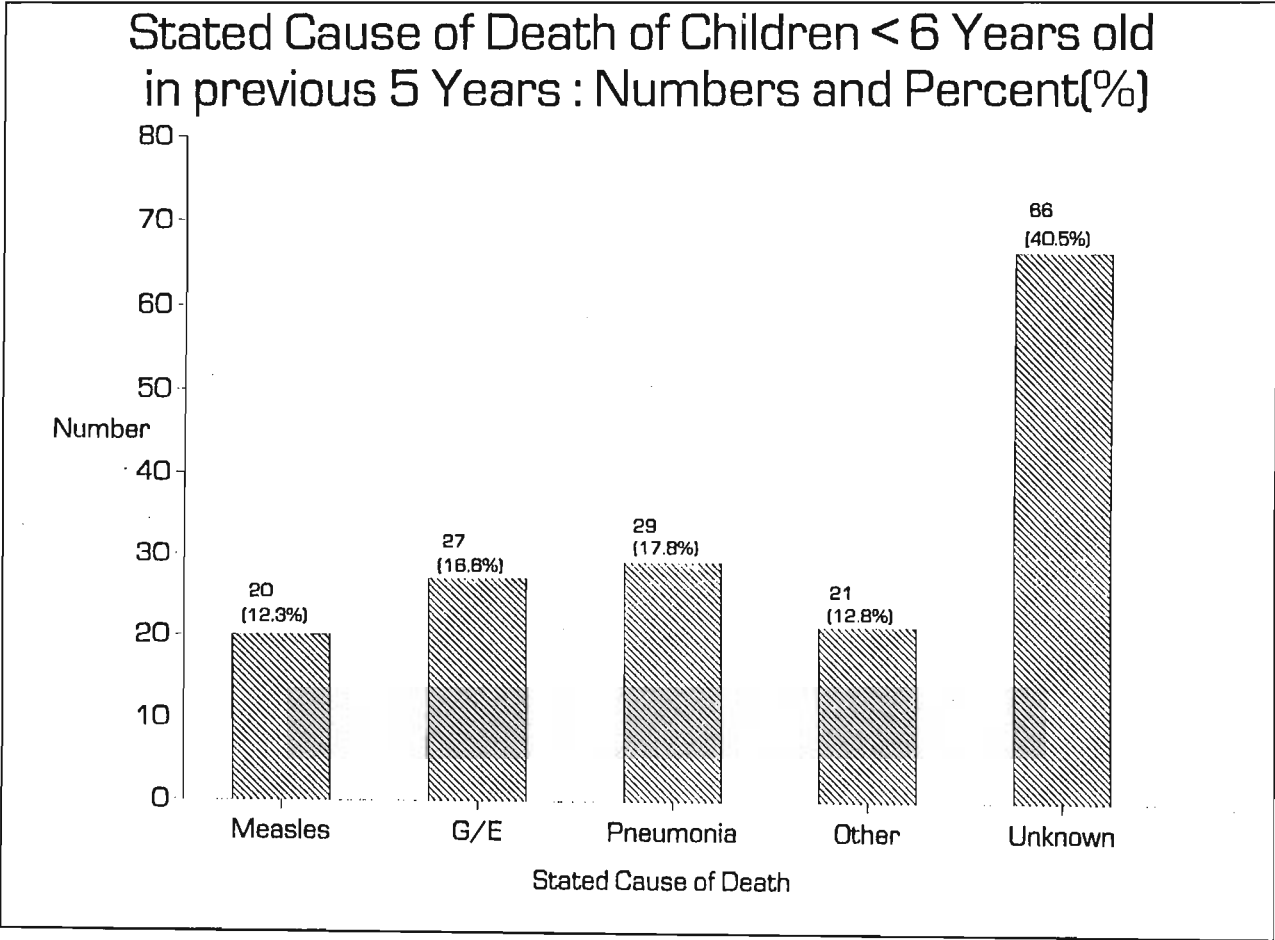
NOTE: No attempt was made to calculate the incidence rates of the conditions listed above as the estimated numbers were based on recall of events in the previous 3 - 6 months. In addition many childhood illnesses are seasonal in nature and the resulting estimate would be biased as a result.

MORTALITY IN CHILDREN UNDER 6 YEARS

A. The mortality of children less than 6 years old in households over the previous 5 years was recorded. The long recall period is a potential source of bias however, the death of a child is a major event and because the sample size was small it was decided to use this long recall period.

Over the 5 year period (prior to the study) 97 deaths were recalled (TABLE 13, FIGURE 10).

FIGURE 10



Measles, gastroenteritis and pneumonia were responsible for 20 (21%), 27 (28%) and 29 (30%) deaths respectively. These 3 diseases thus accounted for 76 (79%) deaths. All 3 diseases can be prevented or treated early enough to prevent death, through the promotion and application of the principles of PHC (TABLE 13, FIGURE 10).

Twenty one deaths (22%) were reported as being due to unknown or other causes. This may partly be attributed to the long recall period, to poor communication between health workers (including hospital staff) and parents of affected children and family members not being able to define the cause of death should this have occurred at home.

In children under 1 year of age 61 (63%) deaths occurred, of which 9 (15%) were due to unknown causes. This suggests that the IMR is high in the area. It would however be difficult to estimate the IMR as the recall period is long and a large influx of migrant labour takes place to the area from the Transkei. Furthermore the accuracy of assessing the age of a child under 1 year of age is also difficult due to the tendency to "round off" to the nearest whole year in age estimates. This makes the estimation of the true denominator population difficult.

B. Place of Death (in previous 5 years)

Of the 97 reported deaths 48 (49%) occurred at home and 49 (51%) in hospital. A total of 77 (79%) of these deaths occurred in children under 2 years of age (TABLE 14).

The place of death of children under the age of 1 year was more commonly home than in other age groups, $\chi^2_1 = 6,44$ ($p < 0,01$).

OBJECTIVE 4

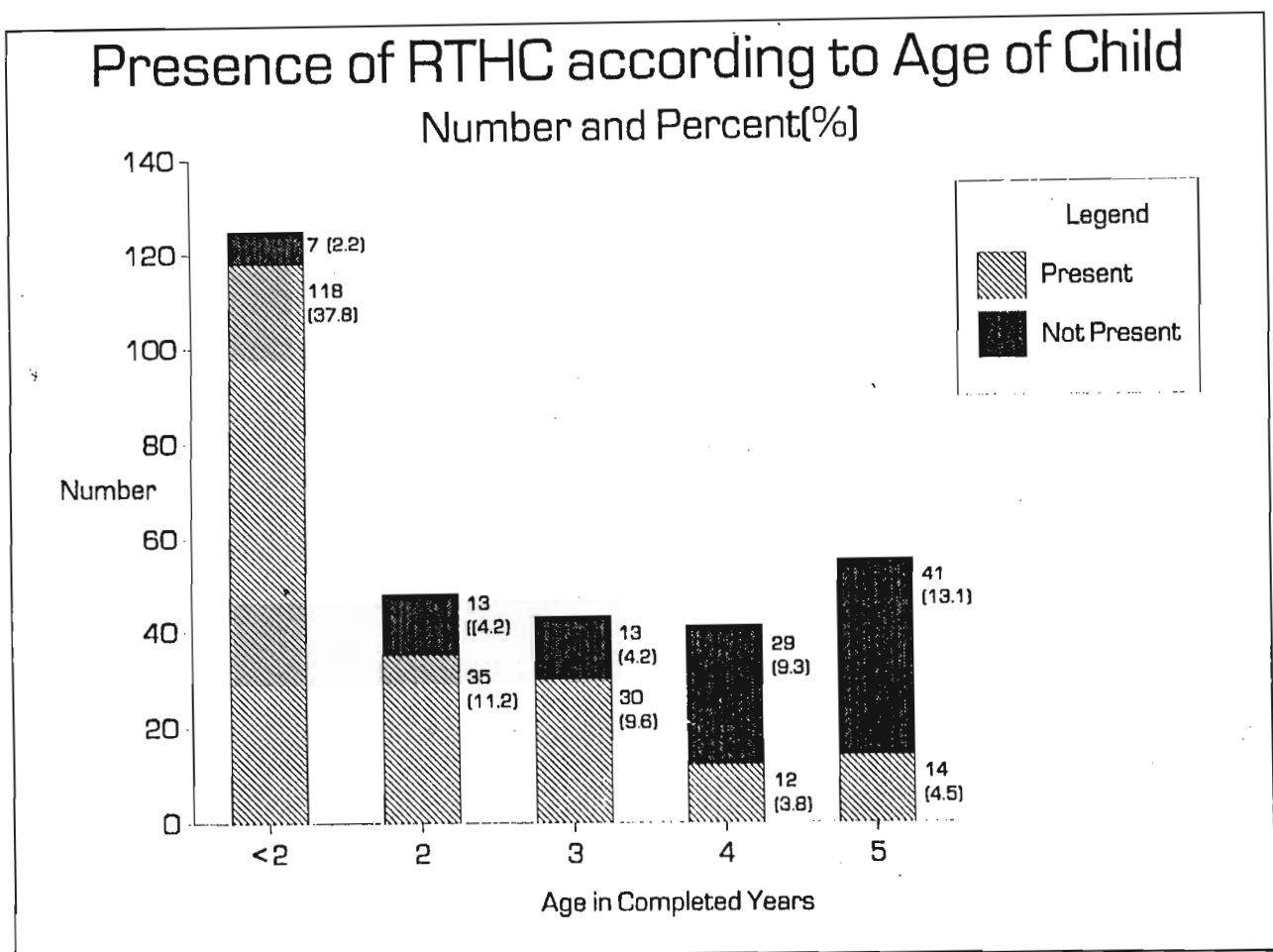
COMMUNITY AWARENESS AND PRACTICE OF GOBI-FFF

GROWTH MONITORING

A. Presence of Road to Health Cards (RTHC)

One of the criteria used to assess the status of immunisation coverage in this study was the information recorded on the RTHC. (Some vaccination administration was however recorded on the clinic card carried by the patients and this was accepted in these cases).

The presence or absence of the RTHC was also noted in relation to the age of the children (TABLE 15, FIGURE 11).

FIGURE 11

Of the 312 children under 6 years of age who were included in the study, 209 (70%) had a RTHC and 103 (30%) did not.

An encouraging finding was the presence of a RTHC for 85% of children aged 3 years and younger. This compares with 27% of children over 3 years of age who were in possession of a RTHC (TABLE 15, FIGURE 11).

However, as later results indicate, and as was discussed above

under Growth Monitoring, the mere presence of a RTHC does not in itself improve growth monitoring - nutritional status assessment, immunisation coverage, or indeed the level of understanding of the value of a RTHC.

The assessment of immunisation coverage of a community on the basis of records kept on the RTHCs and clinic records carried by patients is a limitation of the study, but in the absence of resources which would enable serological testing, health planners/workers have little other option but to utilize existing information systems i.e. RTHCs in the community.

The presence of a RTHC was found to be significantly more common in children under 3 years of age, $\chi^2_1 = 90,3$ ($p < 0,00001$). This may suggest more recent motivation to use RTHCs by clinic staff or less use of RTHCs more than 3 years previously or mothers discarding cards after 3 years of age.

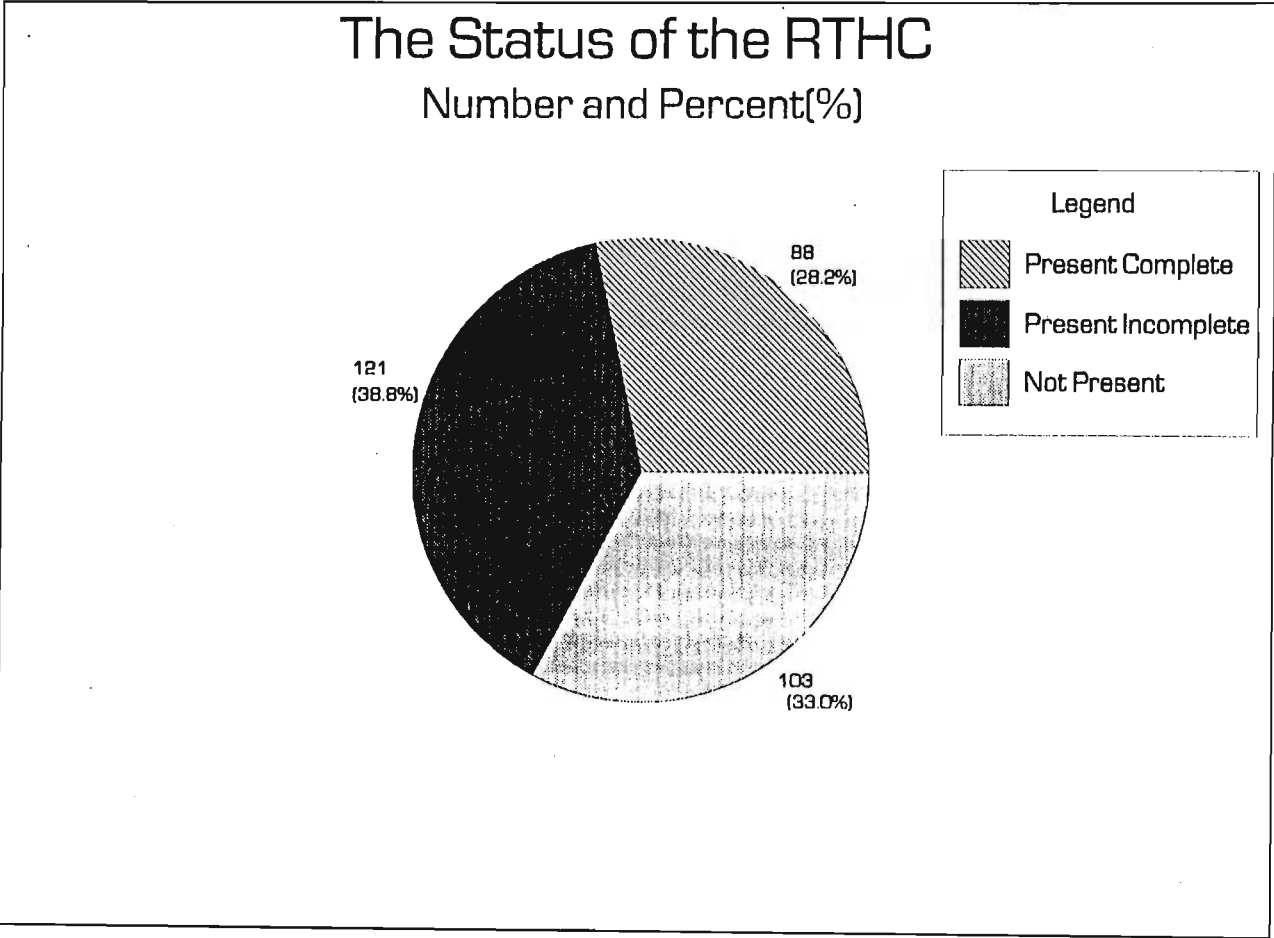
B. The Completeness of Information on the RTHC

Completeness of RTHCs was assessed by checking the entered measurements on the growth curve and relating this to action taken (if required), and the immunisation schedule recorded according to the age of the child.

Of the 209 cases where a RTHC was present it was found that 88

(42%) were complete-for-age of child and 121 (58%) were incomplete. When this figure is extrapolated to the total number of children under 6 years of age it is evident that in only 28% of cases were RTHCs up-to-date (complete) (TABLE 16, FIGURE 12).

FIGURE 12



This would at first glance seem to be an unsatisfactory state of affairs and may indicate that many children do not attend clinics or hospitals but use G.Ps or traditional healers, where RTHCs are not supplied or maintained. However, when one considers that fairly stringent rules were applied to assess the status of the RTHC it is encouraging, in many respects, that 70% of children are at least in possession of a RTHC.

ORAL REHYDRATION THERAPY (ORT)

A. The Number of Households who have Heard of ORT

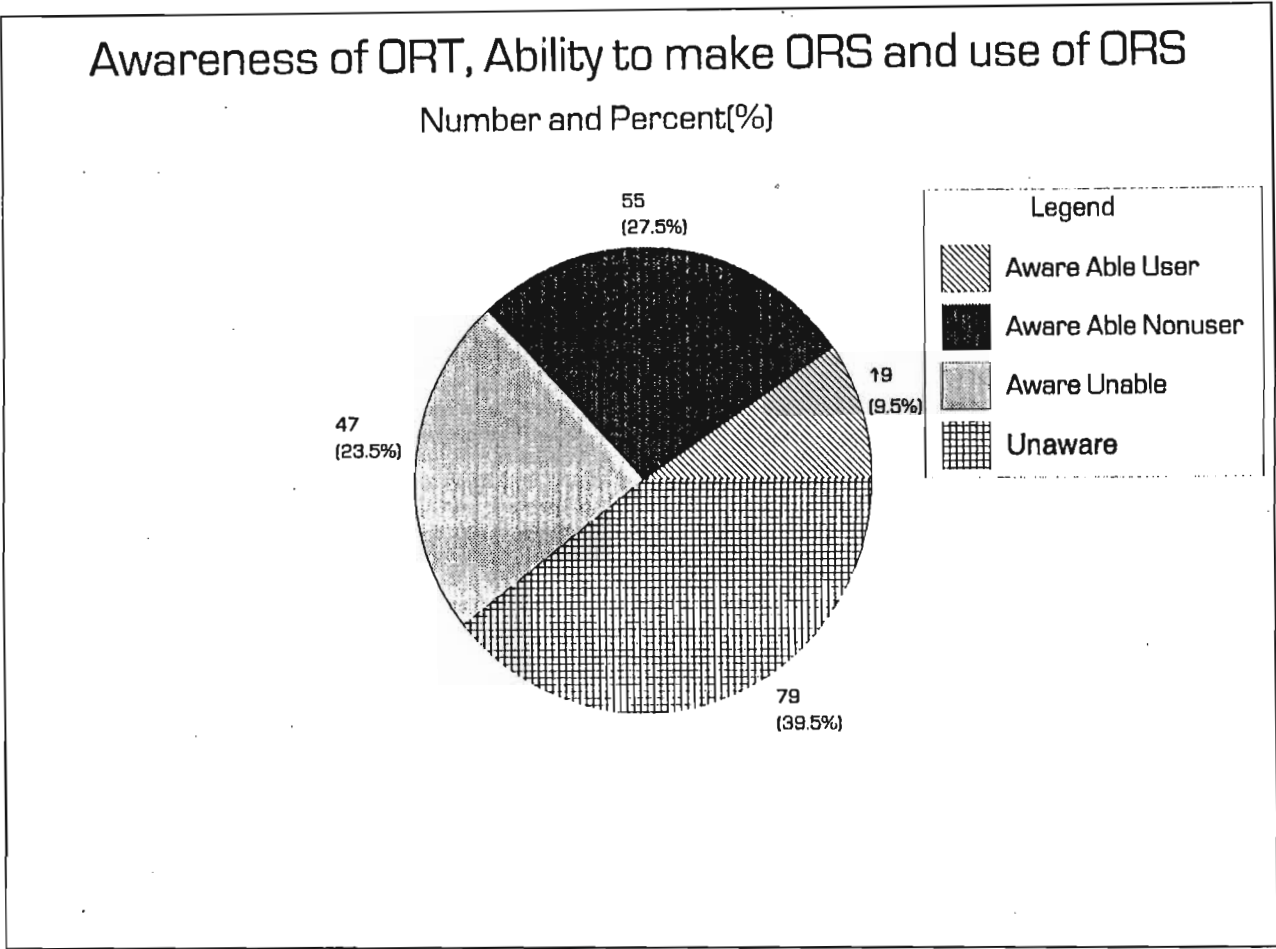
Two hundred household heads or mothers (includes childminders >18 years old) were interviewed in the study. One hundred and twenty one (61%) had heard of ORT as a method of treating gastroenteritis (G/E) and 79 (39%) claimed not to have heard of ORT (TABLE 17, FIGURE 13).

B. Knowledge about making ORS to use in ORT

Of the 121 households who were aware of ORT it was found that 74 (61%) knew how to make ORS - either using "Sorol" or glucose and salt solution (TABLE 18, FIGURE 13). Therefore of all households surveyed, 74 (37%) knew how to make ORS for use in ORT.

Knowledge of how to make ORS does not necessarily lead to the practice of ORT in gastroenteritis however. This is discussed further below.

FIGURE 13



C. Use of ORT by those Households who Know how to Make the ORS

Of the 74 households where knowledge on how to make ORS was positively assessed (either using "Sorol" or glucose and salt solution) 19 (26%) had used ORT in the treatment of gastroenteritis (TABLE 19, FIGURE 13). This figure represents 10% of all households interviewed.

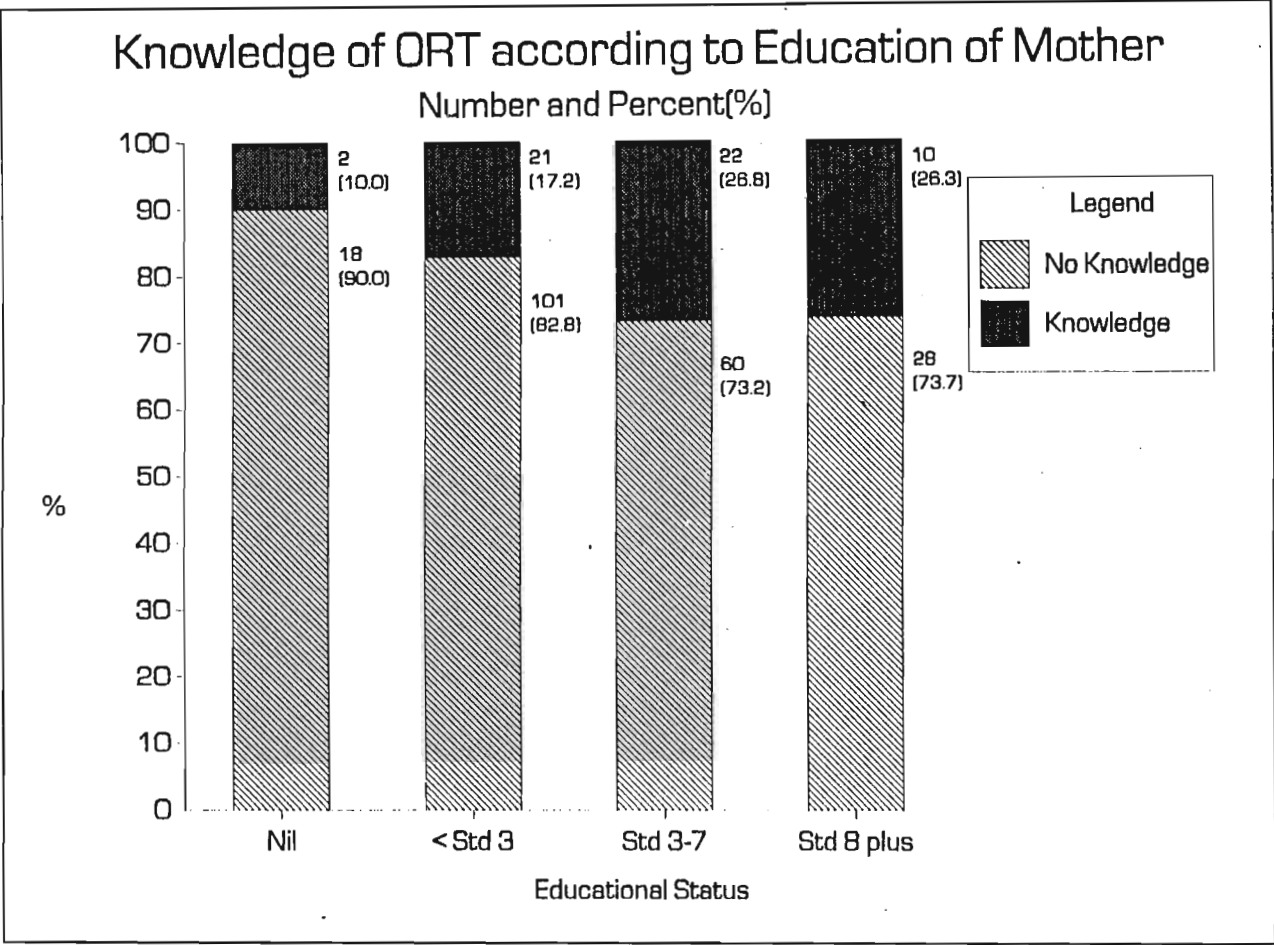
D. Number of Children Hospitalised After use of ORT

It was reported that 5 (26%) of the 19 children in respect of whom ORT was used were admitted to hospital. This figure does not however take into account the number who attended the clinic or hospital after using ORS/ORT for observation or check-up (TABLE 20).

E. Association between Education of Mother and Knowledge of Making ORS

Mothers in a household, (in some households there was more than 1 mother who were not necessarily related), were questioned on their knowledge of how to make ORS and their level of completed education (TABLE 21, FIGURE 14).

FIGURE 14



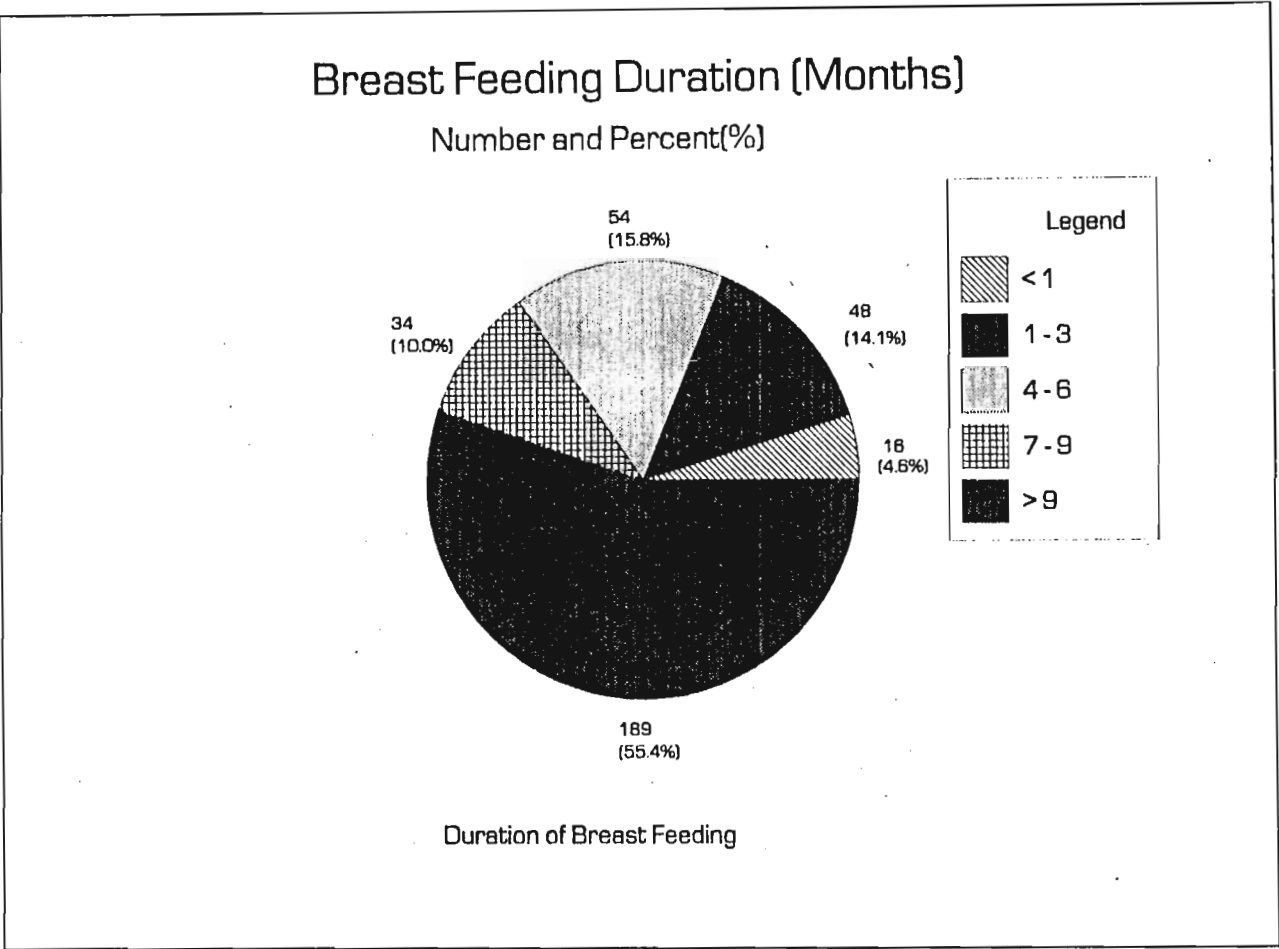
Of the 207 women interviewed, 55 (27%) knew how to make ORS. The association between mothers knowing how to make ORS and an education of Std 3 or greater was statistically significant, $\chi^2_1 = 6,68$ ($p < 0,01$).

BREAST FEEDING

A. Percentage of Breast-Fed Children

Information on Breast Feeding was obtained in respect of 341 children (some of whom were 6 years old). Of these, 16 (5%) had never been Breast Fed or had been Breast Fed for less than 1 month. A further 48 (14%) had been breast fed for between 1 and 3 months (TABLE 22, FIGURE 15). Therefore 64 (19%) children had received less than 4 months of breast feeding. It is encouraging that 81% had received 4 or more months of breast feeding. Weaning occurred after 6 completed months in 170 (50%) of cases.

FIGURE 15



B. Reasons Given for Stopping Breast Feeding

In respect of the 341 children (above), the reasons given for stopping breast feeding were as follows:-

NO MILK	-	15 (4%)
NOT ENOUGH MILK	-	56 (16%)
MILK SUBSTITUTE PREFERRED	-	2 (1%)
MOTHER WORKING	-	59 (17%)

WEANING*	- 177 (52%)
OTHER	- 32 (9%)

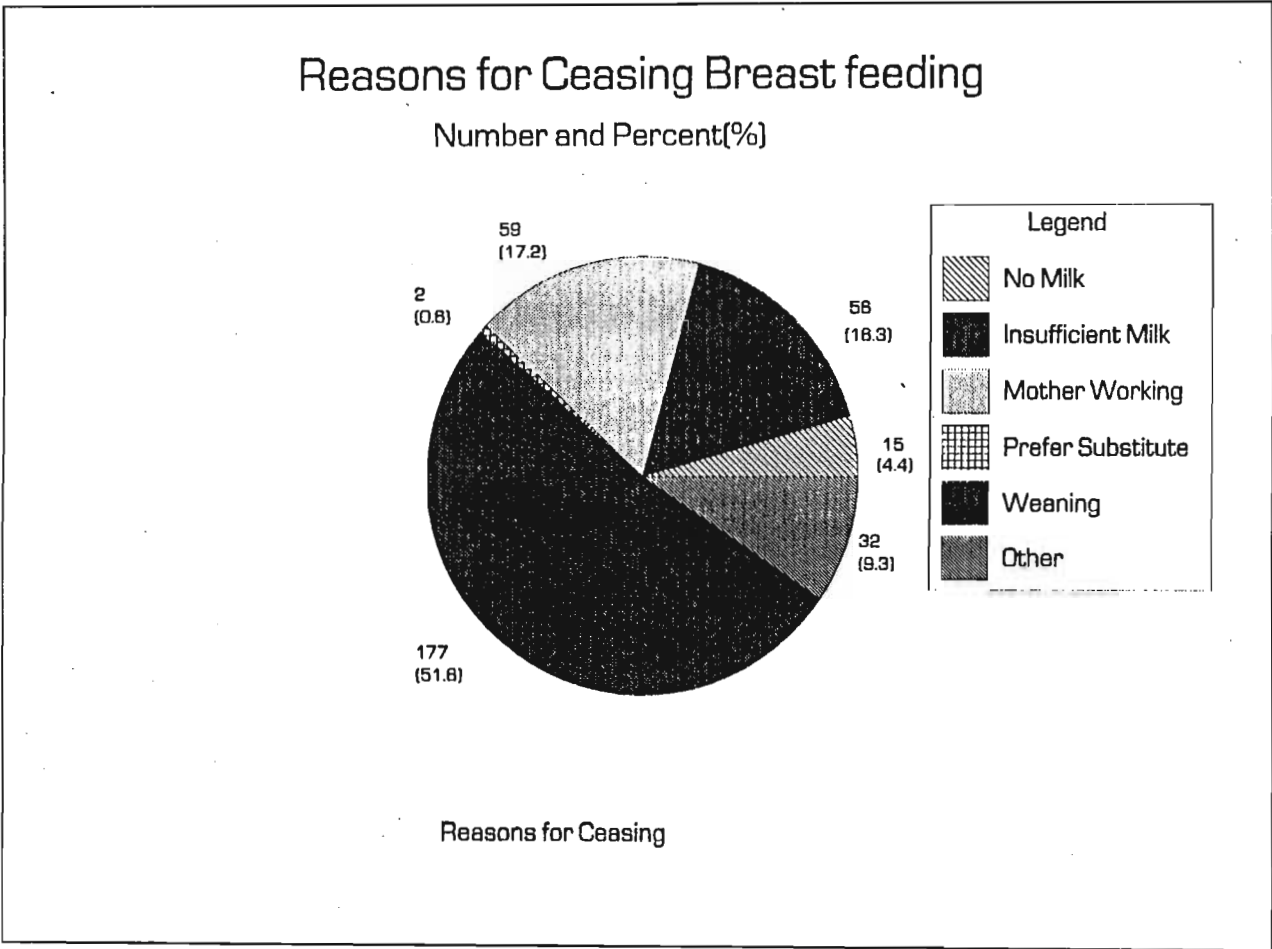
* WEANING: Cessation of breast milk after 9 months (see Definitions)

In those children where breast feeding was stopped voluntarily, 167 (97%) completed weaning after the age of 9 months (TABLE 22, FIGURE 16). This definition of weaning should not be confused with the period of introduction of "weaning" solids when breast feeding is maintained.

Mothers who were employed stopped breast feeding before the age of 7 months in 34 (10%) cases. The high rate of unemployment among women would account for this seemingly low rate of cessation of breast feeding for economic reasons (TABLE 2).

One hundred and eighty nine (55%) children were breast fed for at least 9 months.

FIGURE 16



IMMUNISATION

A. Overall status of Immunisation (children under 6 years)

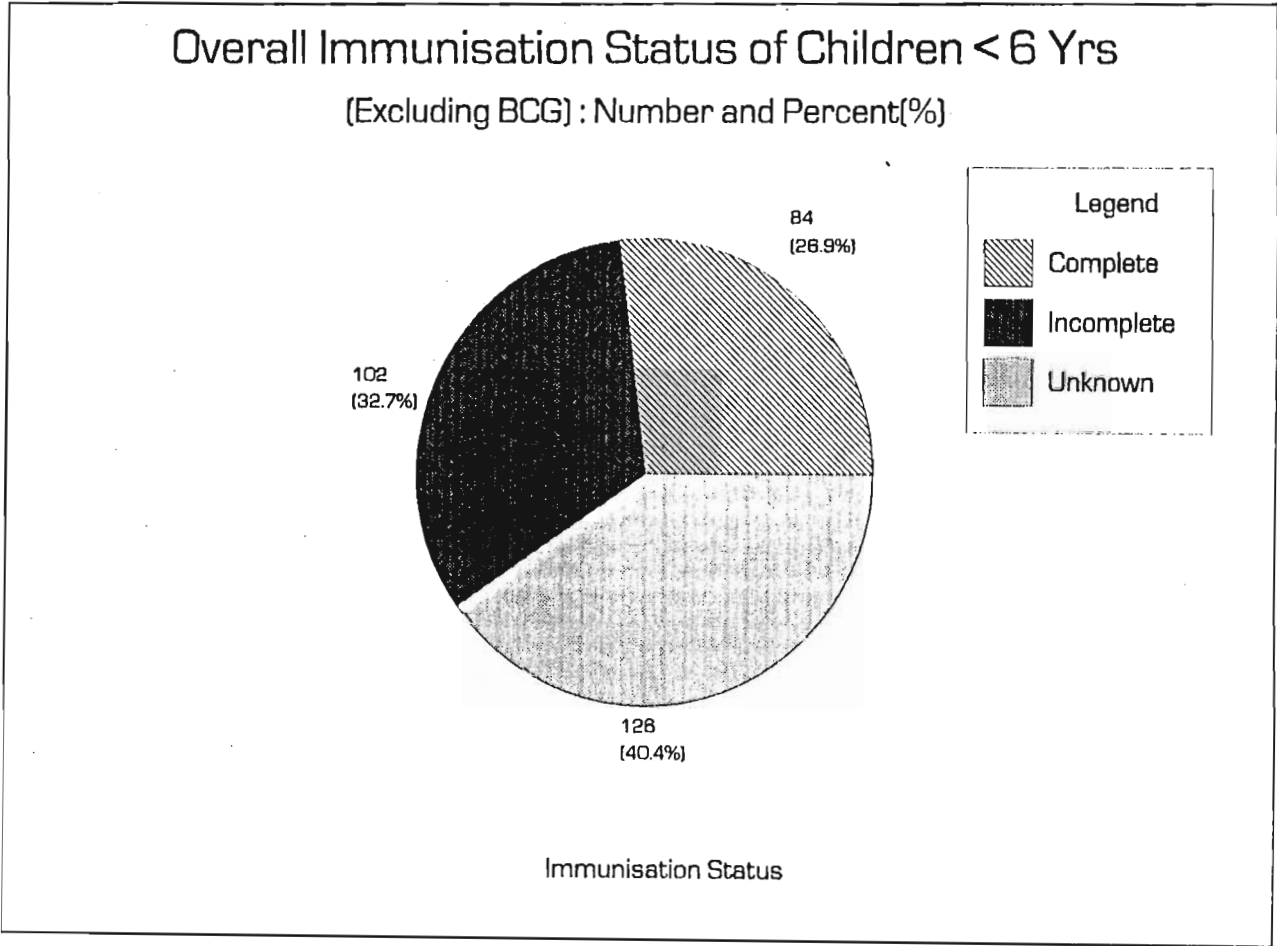
The status of immunisation in this study was assessed purely on the written record of a RTHC or patient carried clinic record or presence or absence of a scar in the case of BCG. This is a limitation and source of bias in the study, however it was considered that knowledge of the overall use of the RTHC in the community was important and furthermore, other practical options were unavailable. The RTHC is an official record of individual immunisation records and information on its utilisation is of importance to health workers and health managers. In some households a child had a RTHC (or even 2) and a clinic record card.

Of the 312 children about whom immunisation status was recorded in the course of this study the following results were obtained [excludes BCG status] (TABLE 23, FIGURE 17)

COMPLETE (FOR AGE)	-	84 (27%)
INCOMPLETE (FOR AGE)	-	102 (33%)
UNKNOWN (no RTHC)	-	126 (40%)

Thus 186 (60%) have had either complete or incomplete exposure to vaccination. (Exclude BCG coverage from these figures).

FIGURE 17



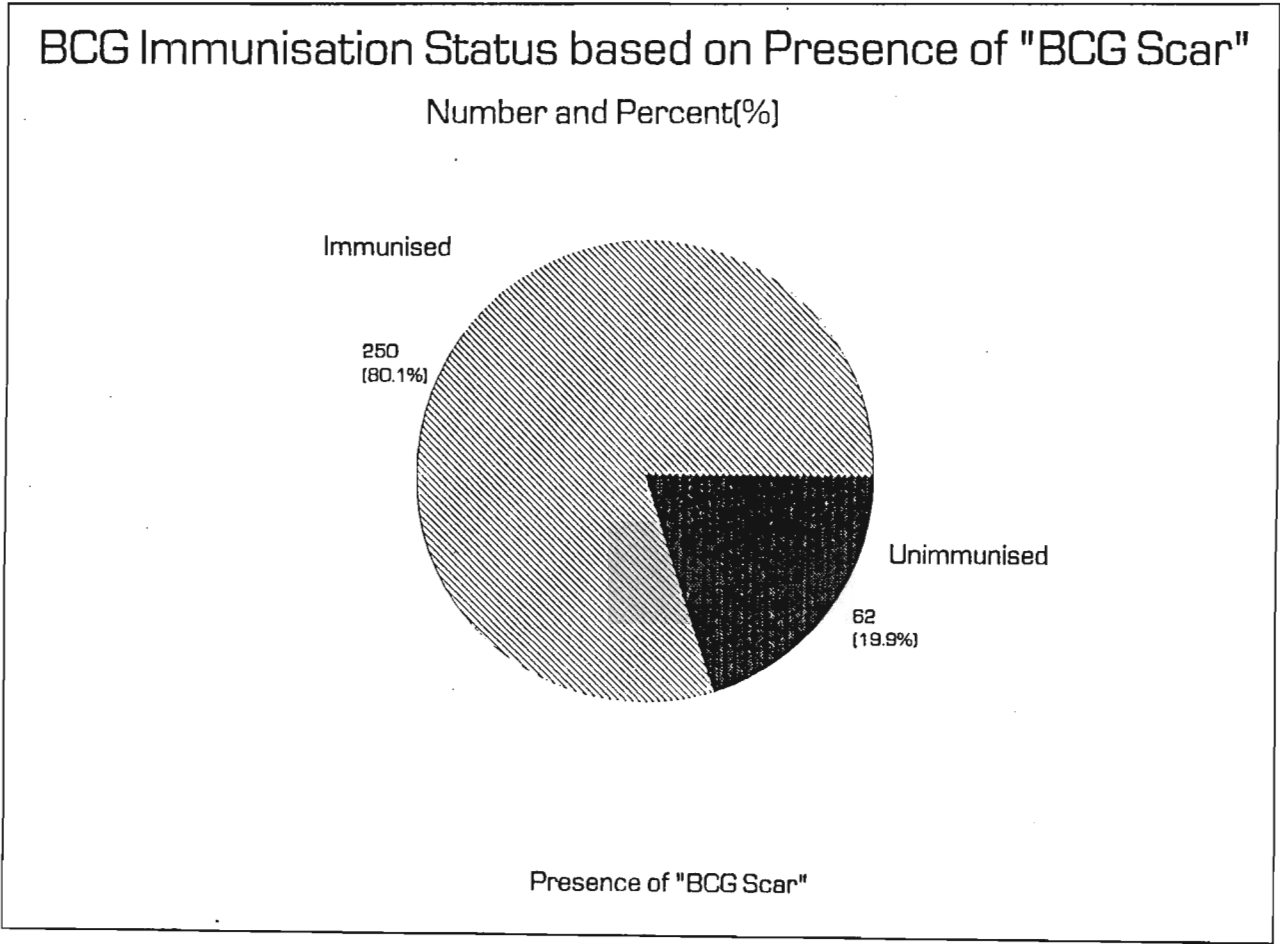
Assuming "worst-case" count (where all unknown cases are assumed to have had no vaccine administered), the result is that 126 (40%) children have had no vaccination exposure whatsoever.

B. BCG Immunisation Status

Three hundred and twelve children were included in the study and 250 (80%) showed evidence of having a BCG scar on the upper arm (TABLE 24, FIGURE 18).

Of the 129 infants who were 2 years of age or less, 111 (86%) showed evidence of BCG vaccination.

FIGURE 18

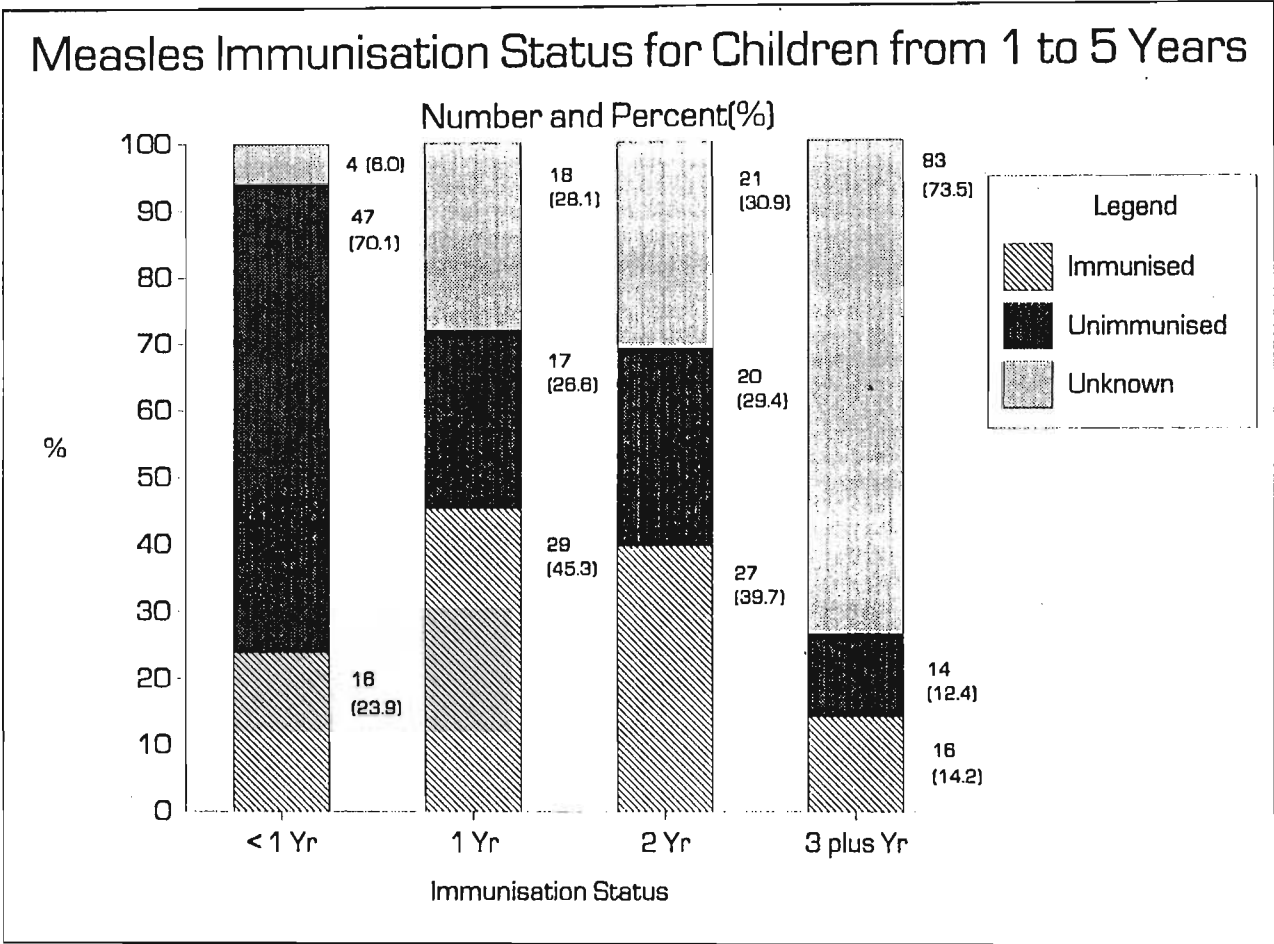


There was no statistically significant association between age of child and BCG vaccination status in this study ($0,1 > p > 0,05$).

C. Measles Immunisation Status (based on RTHC record)

A limitation of the study was that for immunisation against measles the number of children between the ages of 9-12 months could not be determined, as those children aged less than 1 year formed a single category in the analysis of the questionnaires (TABLE 25, FIGURE 19). By the age of 1 year however, all children should have been immunised against measles. The age category "less than 1 year" includes children under the age of 9 months and this category is thus not discussed in the results, as a distorted picture of immunisation status will result.

FIGURE 19



Twenty nine (45%) children between the age of 12-23 months were known to be immunised against measles. Seventeen (27%) and 18 (28%) were not immunised and of unknown status respectively (based on RTHC record). Thus for the purposes of this study 55% of children between 12-23 months were not immunised.

For children aged 2 years or more, 43 (24%) were known to have been immunised against measles and 138 (76%) were either not immunised or could not show a RTHC (unknown).

Measles immunisation coverage rate was significantly greater in children under 2 years compared with older children, $\chi^2_1 = 10,57$ ($p < 0,01$).

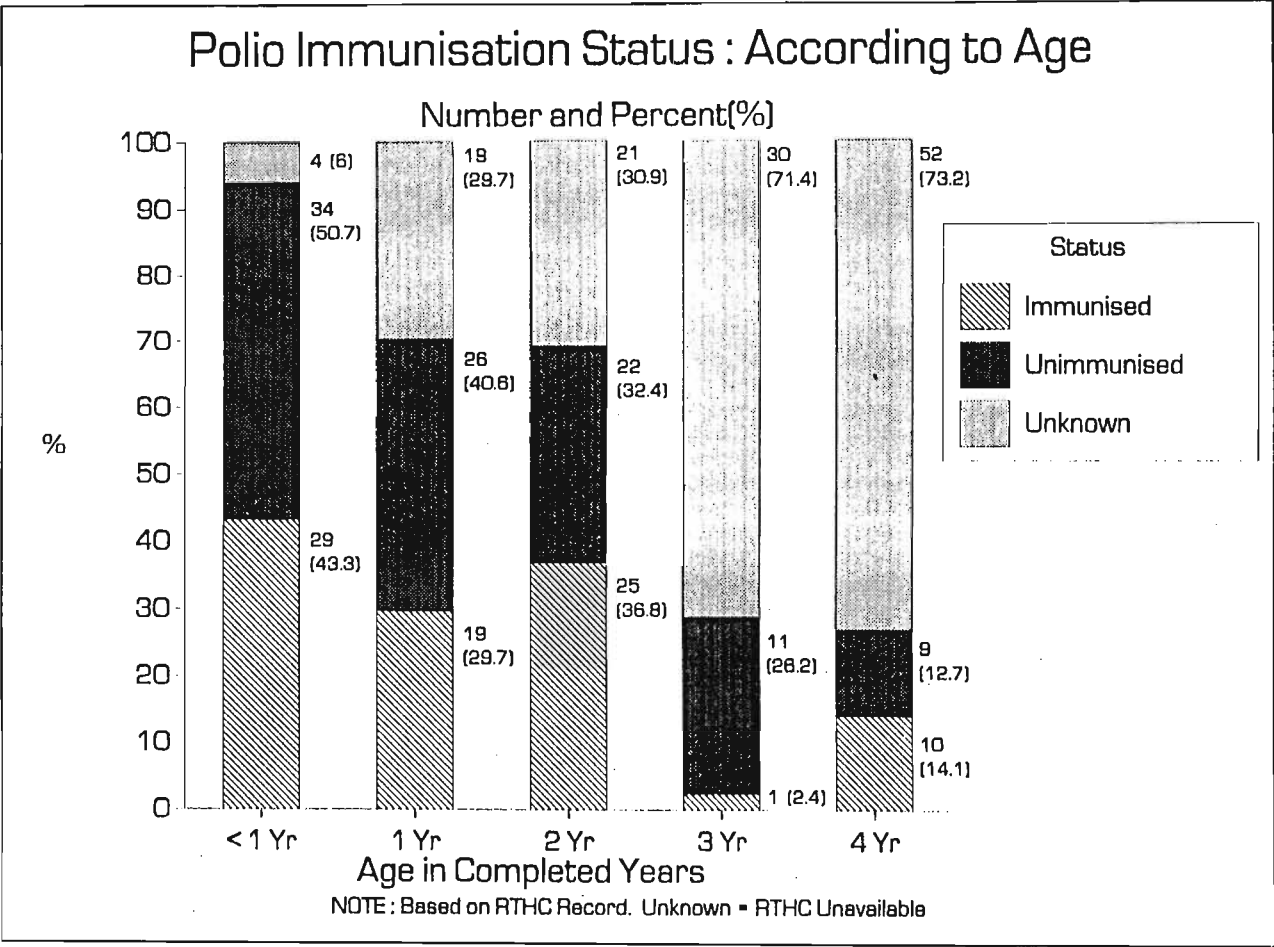
D. Polio Immunisation Status (based on RTHC record)

(This study was completed 4-5 months prior to an epidemic of Polio (1987/88) which affected KwaZulu/Natal).

Incomplete status, for the purposes of this study meant that the child had not received the correct number of polio vaccinations for age at time of interview.

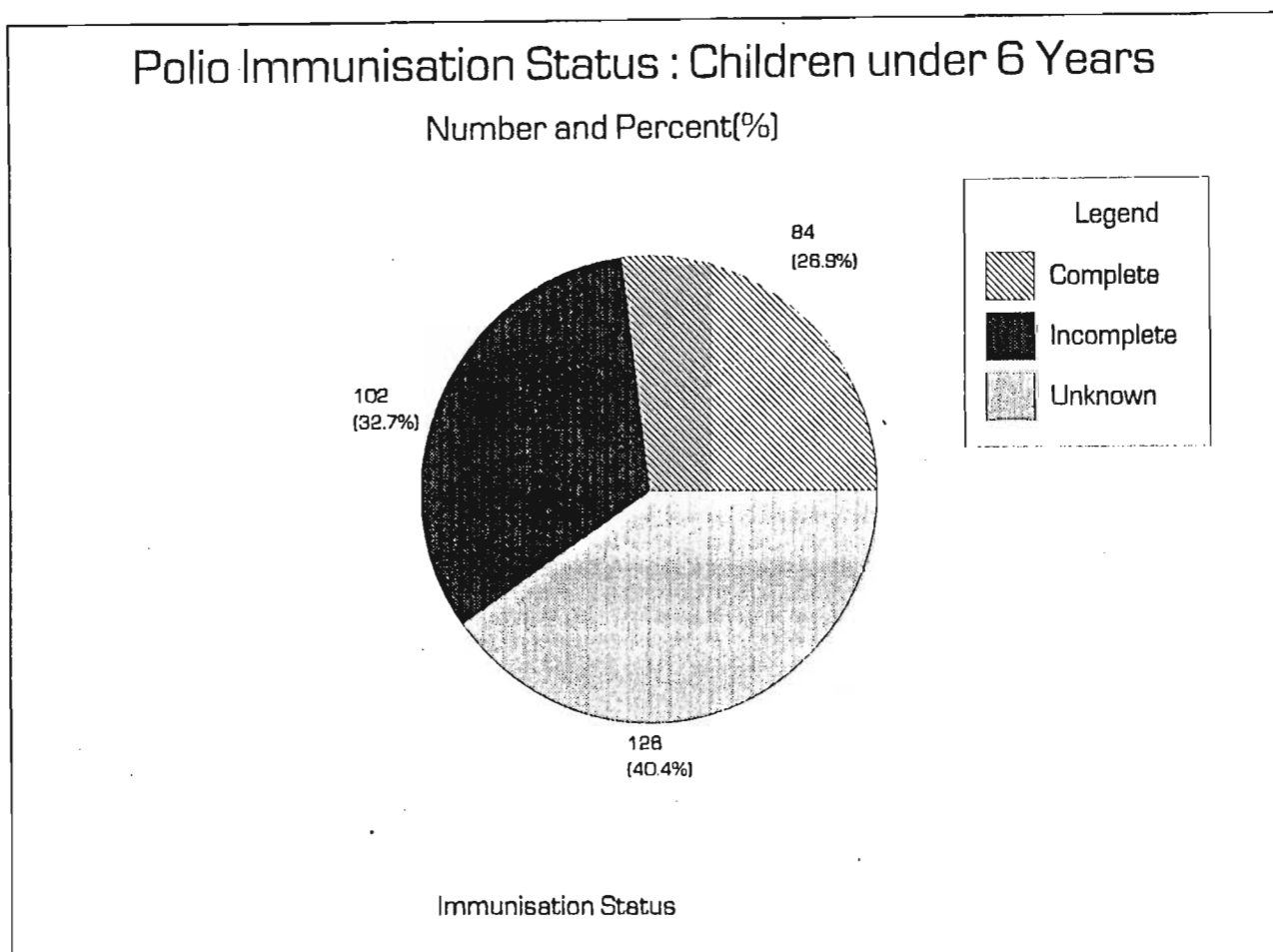
Complete coverage was noted in 84 (27%) children under 6 years of age (TABLE 26, FIGURES 20 & 21). (Those under 3 months of age were assumed to have complete immunisation status for the purposes of this study - at the time this study was performed it was not KwaZulu Department of Health policy to administer Polio vaccine at birth whereas it is current policy.)

FIGURE 20



Incomplete coverage i.e. at least 1 dose, accounted for a further 102 (33%) children.

At least 186 (60%) children had received 1 dose of polio (Trivalent) vaccine based on RTHC records (TABLE 26, FIGURE 21).



The immunisation status of 126 (40%) children was unknown based on the absence of a RTHC (or clinic record). No information was received of a Polio vaccine having not been given for a particular reason, e.g. gastroenteritis.

For those aged 2 years or less, 73 (37%) were completely immunised (TABLE 26).

DWT immunisation coverage rate was significantly greater for

children under 1 year of age, $\chi^2_1 = 10,57$ ($p < 0,01$) as was the association between age and at least partial exposure to vaccine $\chi^2_1 = 40,17$ ($p < 0,000000$).

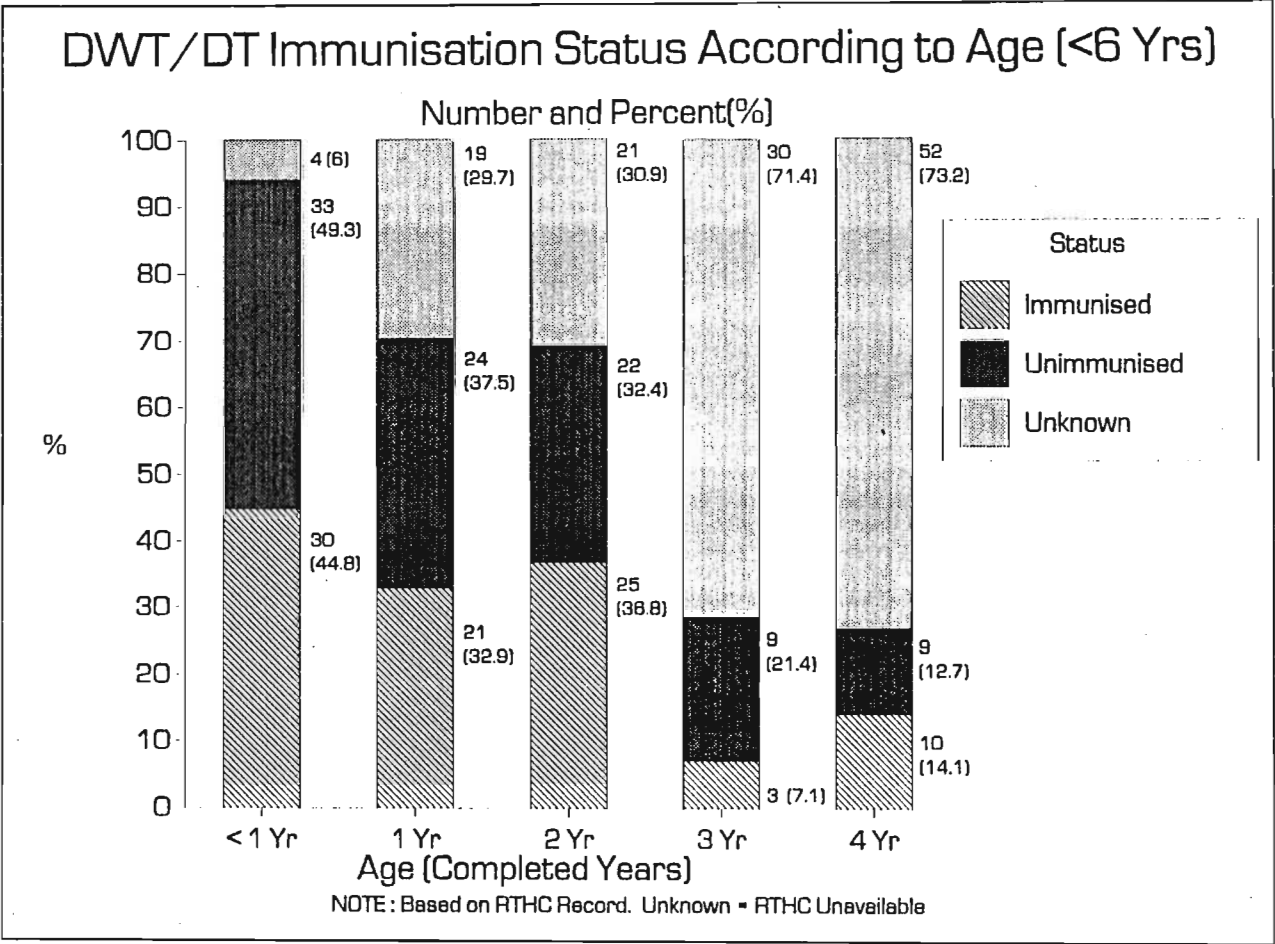
NOTE:- Subsequent to this study being performed a mass immunisation campaign which involved the Bomela area was carried out using Type I Polio vaccine, in response to a polio epidemic in the area.

E. DWT/DT Immunisation Status (based on presence of RTHC)

The schedule for DWT/DT immunisation resembles that for Polio, which is reflected in the results obtained except that there was a slight increase in the number of complete cases immunised with DWT (97 compared to 92 for Polio). This may be due to the fact that nurses at the clinic, until recently, withheld Polio vaccine if a child was suffering from diarrhoea when immunisation against polio was due (TABLE 27, FIGURES 22).

Of the 342 children, 97 (28%) had received complete coverage (for age), 107 (31%) had received at least 1 dose of DWT vaccine and in 138 (40%) cases the status was unknown, due to the absence of RTHC (or clinic cards). For those aged 2 years or less, 40% were completely immunised.

FIGURE 22



Partial or complete immunisation rates for children under the age of 2 years was significantly greater than was the case for older children $\chi^2_1 = 40.17$ ($p < 0.00000$).

F. Is Immunisation Thought to be Important to the Mother or Child Minder (> 18 years old)?

Of 200 mothers interviewed 156 (78%) replied "YES" to the above question and 44 (22%) replied "NO" (TABLE 28).

The reasons were given in the form of an "open-ended" answer (see Annexure C - questionnaire), - 121 (61%) replying that immunisations helped to prevent disease in children and 23 (11%) replying that the clinic/hospital staff had advised them to have their children immunised.

The reasons given for immunisations not being important were that, in 16 (8%) cases, older children who had been immunised had subsequently become ill with the disease which he/she had been vaccinated against and in 1 (<1%) case the child had become very ill and was admitted to hospital subsequent to the immunisation resulting in a fear of further immunisations for other children. Another reason given, in 6 (3%) cases (for not immunising) was that older women of the household had advised against immunisation and in 9 (5%) households the mother did not "know" of the availability of a free vaccination service.

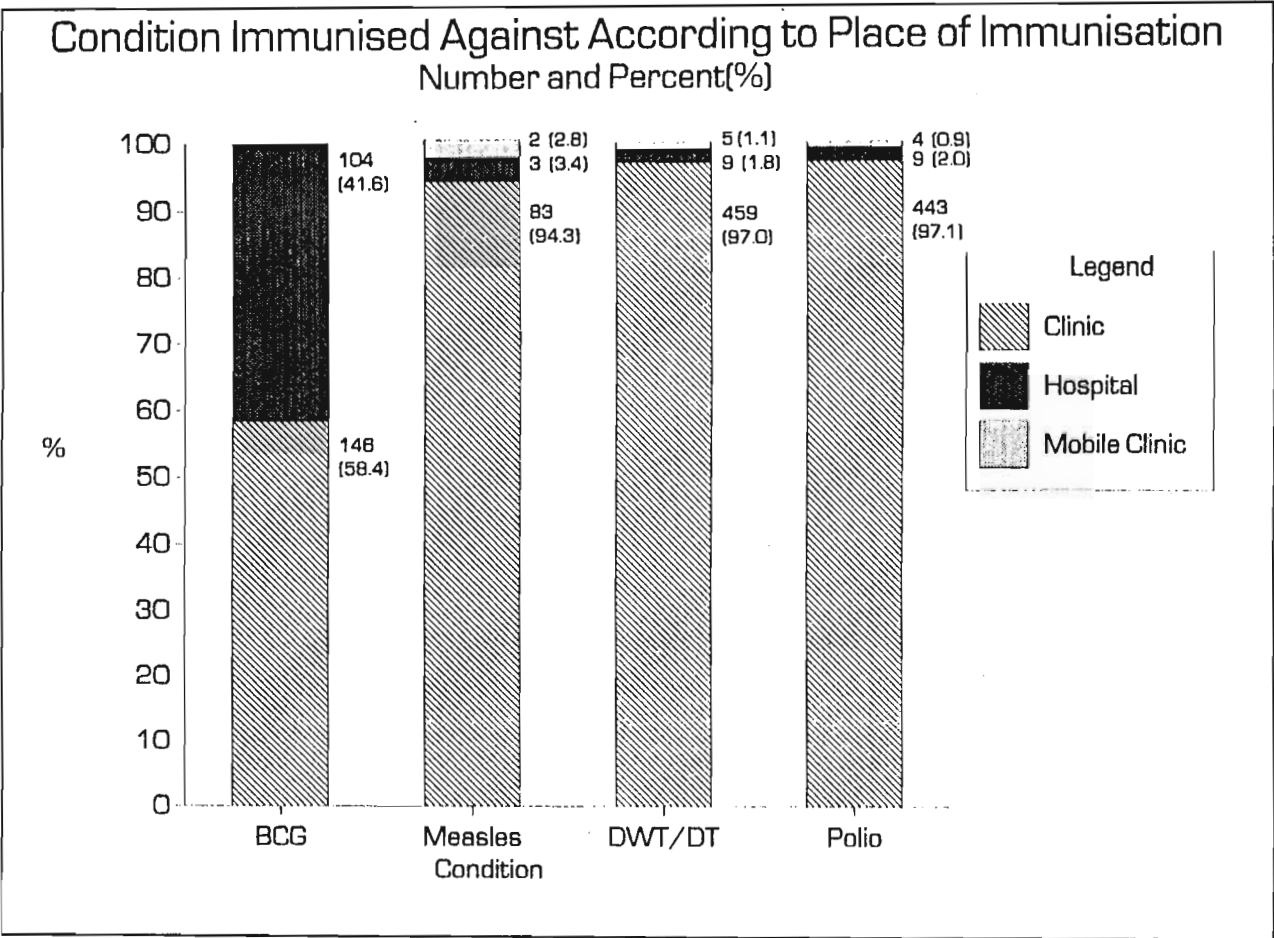
G. Health Facility Where Child was Immunised

The 312 children (less than 6 years of age) about whom information was obtained in the study had received (according to RTHC or clinic records) a total of 1267 doses of vaccine -of which 250, 88, 456 and 473 were BCG, Measles, Polio and DWT/DT respectively (TABLE 29).

Overall 1131 (89%) vaccine doses were administered at a clinic (not necessarily Bomela), 125 (10%) were administered at a hospital (mainly BCG) and 11 (1%) were administered by the Mobile Clinic Team.

The considerable majority (95%) of Measles, DWT/DT and Polio immunisations in the Bomela community are administered at a clinic (TABLE 29, FIGURE 23).

FIGURE 23



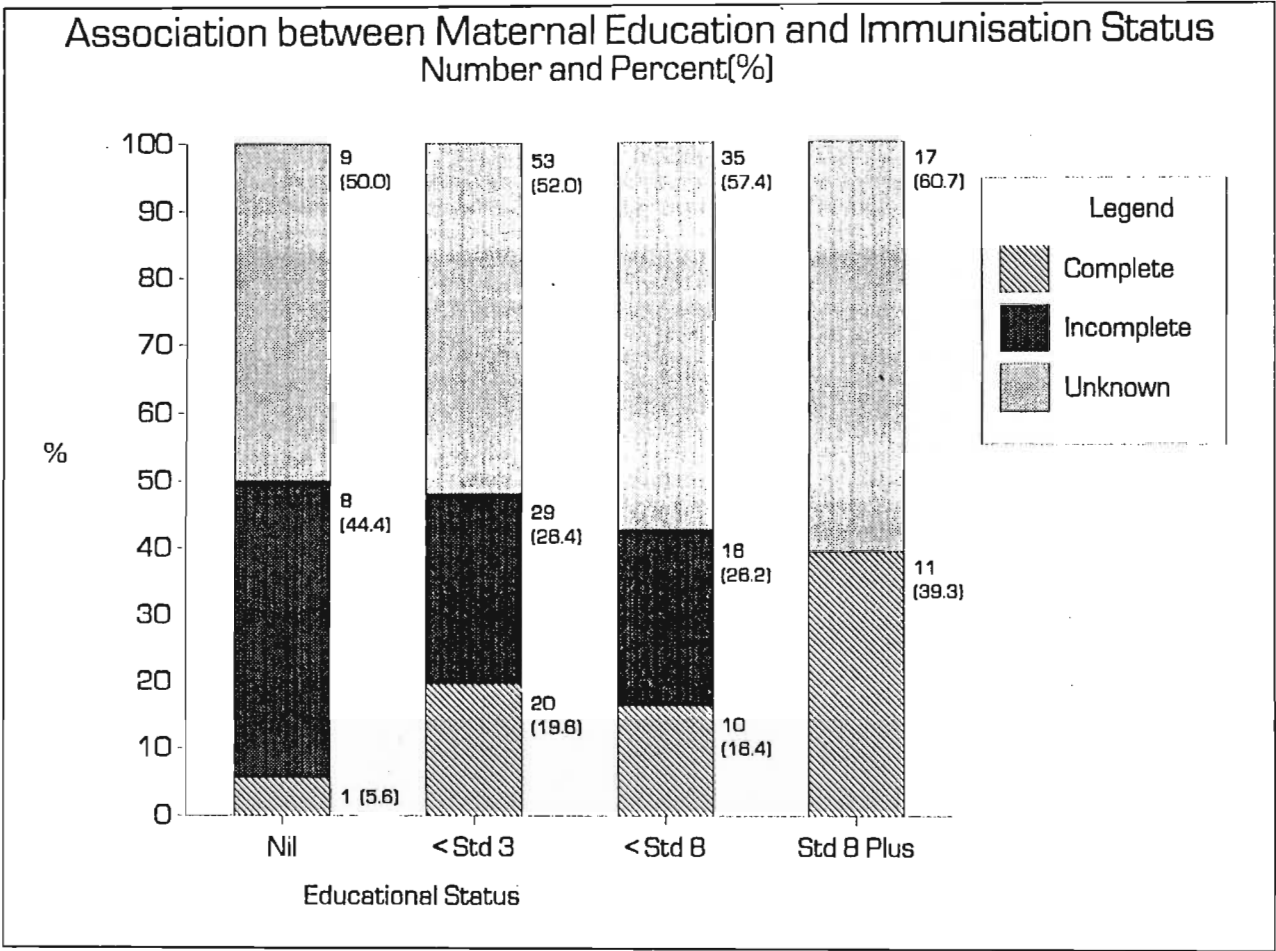
BCG vaccines accounted for 250 (20%) of the total doses of vaccines administered and of these, 146 (58%) were administered at a clinic and 104 (42%) at a hospital.

H. Association between Education of the Mother and Immunisation Status of her Children

A total of 42 (20%) mothers had their children fully immunised (for age) (TABLE 30, FIGURE 24). Of these 42 families, 21 (50%) mothers had less than Std 3 education. The children of ninety five (45%) families had been at least partially exposed to immunisation in in 114 (55%) immunisation status was unknown.

In this study there was no statistically significant association between immunisation status of children and educational level of the mother ($p < 0,5$).

FIGURE 24

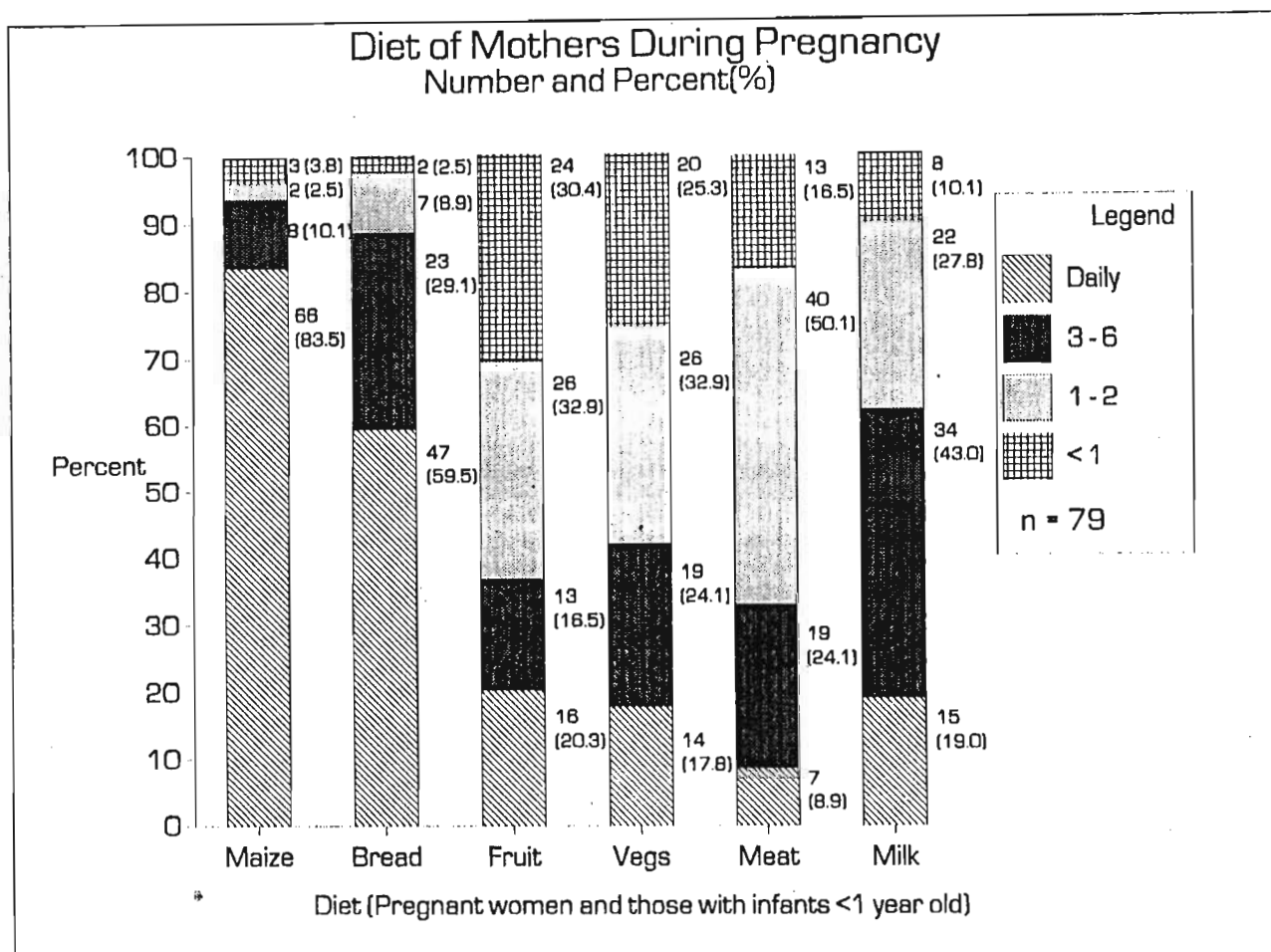


FEMALE NUTRITION IN PREGNANCY

The diet of mothers who had been pregnant within the previous year or, who were pregnant at the time of the interview was studied. It is accepted that the recall period of 1 year is long (see Discussion on "recall periods"), but it was assumed that the diets of pregnant women do not alter in quality during pregnancy in the rural community studied and thus average daily diets would remain unchanged, despite pregnancy.

The results indicated that 83% of the women ate maize (in some form) on a daily basis with a remaining 11% having maize 3-6 days per week.

FIGURE 25



Sixty percent ate bread on a daily basis and a further 29% ate bread 3-6 days per week.

Thirty three percent ate meat or fish more than 2 days per week and a further 50% ate meat or fish 1-2 days per week.

Thirty-seven percent ate fruit more than 2 days per week.

Forty percent ate at least 2 vegetables more than 2 days per week (TABLE 31, FIGURE 25).

FAMILY SPACING

A. Association between Age of Mother and Number of Live Children

A total of 209 mothers were included in the study (TABLE 32).

Of 23 mothers under the age of 20 years, 21 (91%) had 1 child and 2 (9%) had 2 children.

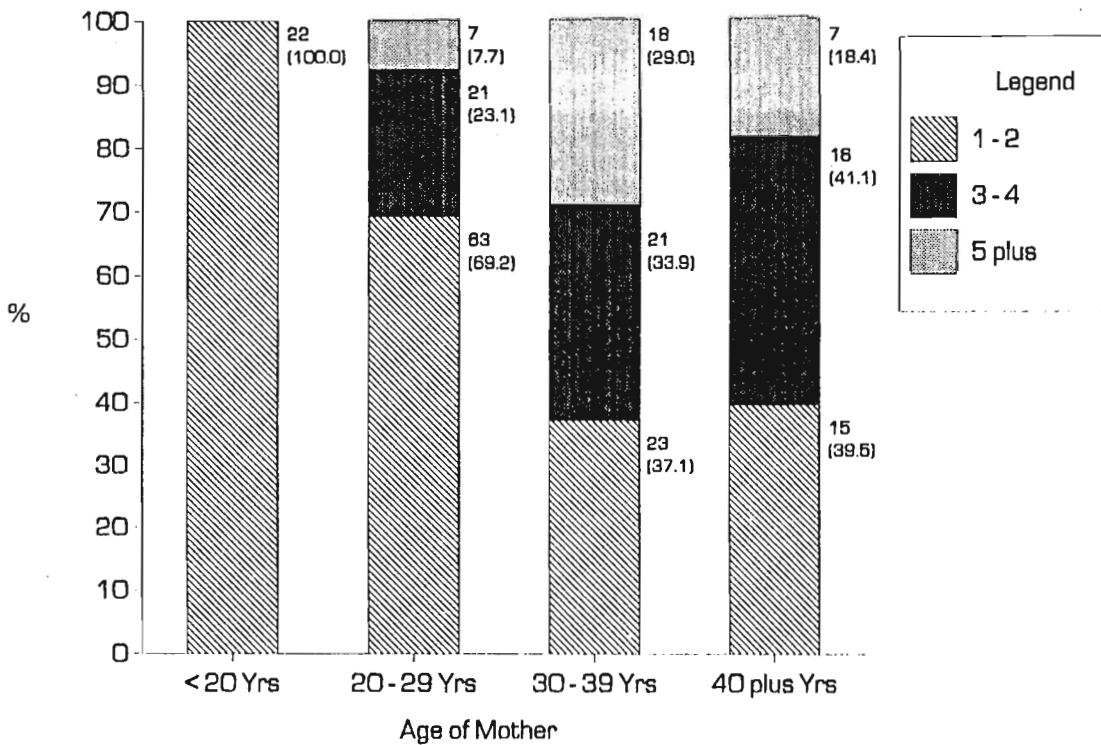
For the 86 mothers between the ages of 20-30, years 34 (40%) had 1 child, 29 (34%) had 2 children and 23 (27%) had 3 or more children.

Sixty two mothers were aged 31-40 years. Of these 23 (37%) had 1-2 children, 21 (34%) had 3-4 children and 18 (29%) had 5 or more children.

Of the 38 mothers aged greater than 40 years, 15 (39%) had 1-2 children, 16 (42%) had 3-4 children and 7 (18%) had 5 or more children (TABLE 32, FIGURE 26).

FIGURE 26

**Family Size (Live Children) According to Age of Mother
Number and Percent(%)**



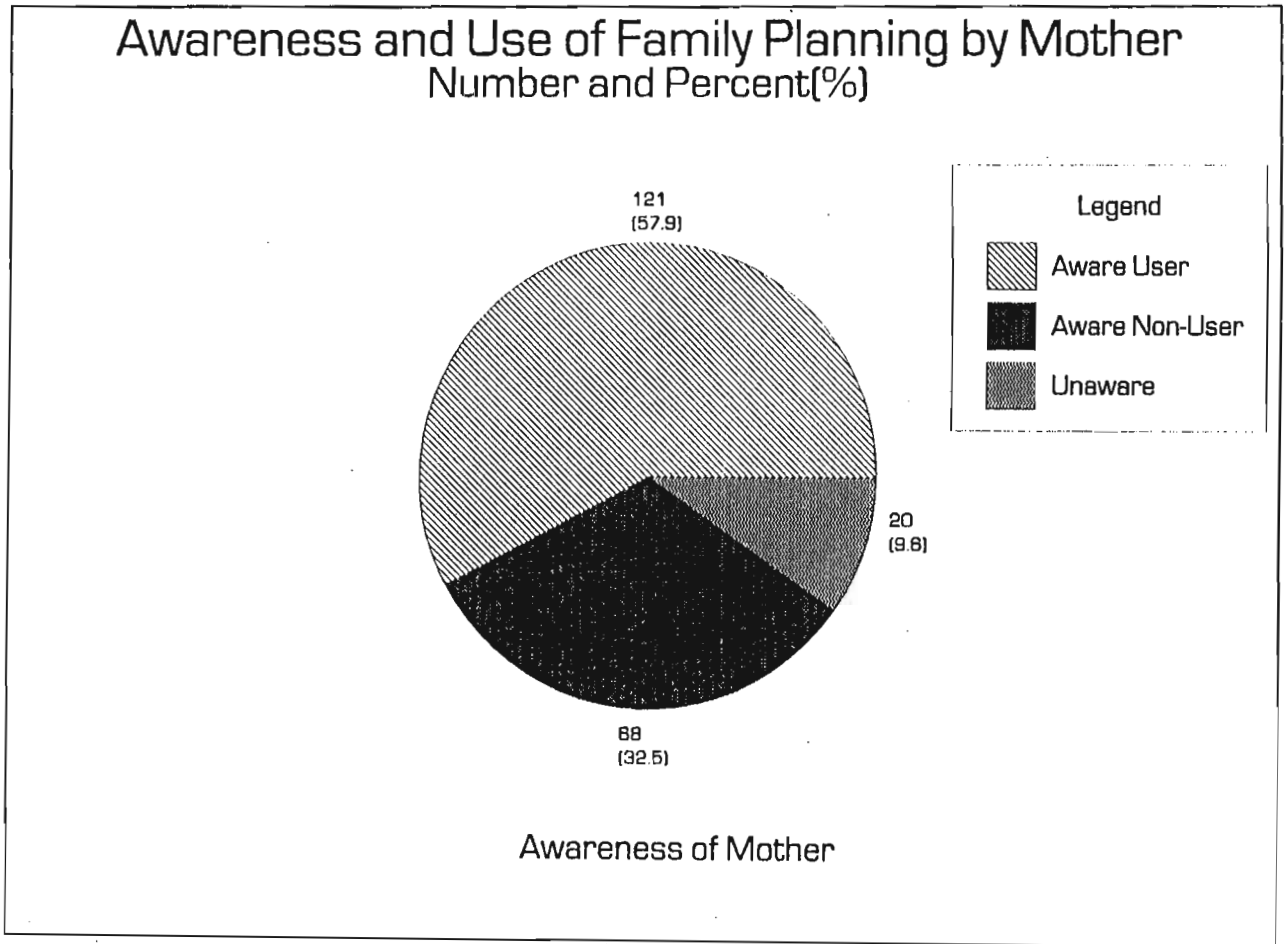
In summary it was found that for all mothers interviewed:-

- 7% of families had 6 or more children alive
- 19% of families have 4 or 5 children alive
- 74% of families had less than 4 children alive
- 60% of families had less than 3 children alive
- 26% of women between ages 20-30 have more than 2 children alive and
- 73% of women between ages 31-40 years have more than 2 children alive.

B. Have Mothers Heard of Family Planning?

Of 209 mothers in the study, 189 (90%) had heard of Family Planning (TABLE 33, FIGURE 27).

FIGURE 27



C. Have Mothers used Family Planning Methods?

Use of a Family Planning method, was claimed by 121 (58%) of

the 209 mothers and 88 (42%) said they had never used a family planning method (TABLE 34) despite 68 (33%) of these being aware of Family Planning.

D. Women (aged 16 - 44 years) who have used or are using Family Planning Methods

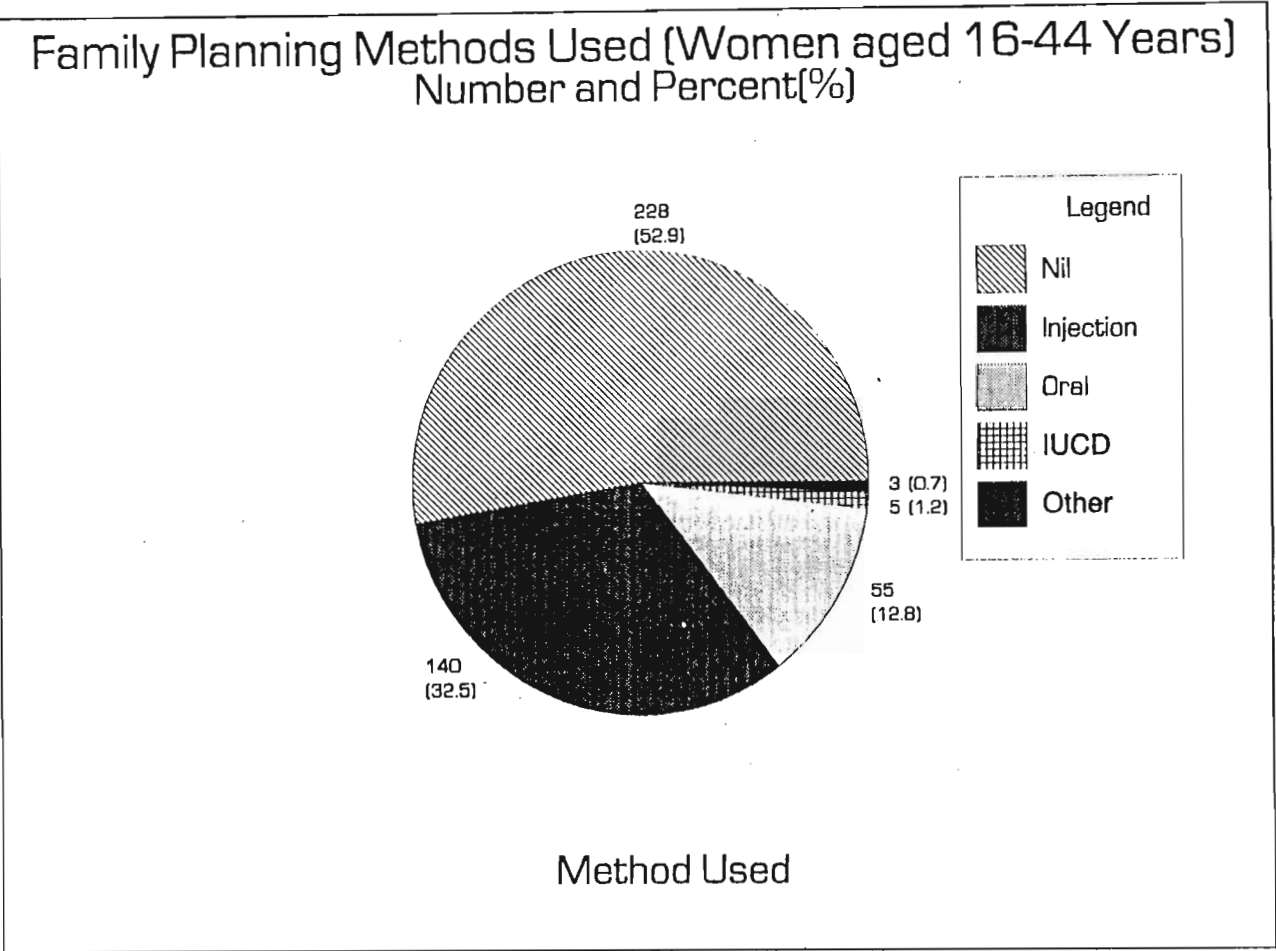
Out of the 431 women aged between 16 - 44 years about whom information was obtained, 203 (47%) claimed to have used or were using one of the Family Planning Methods and 228 (53%) were not (TABLE 35, FIGURE 27).

E. Method of Family Planning Used

The methods used by the 203 women who utilized the Family Planning Service were as follows:-

Depo Provera (injectable) (69%), combined oral contraceptive (27%), I.U.C.D (3%) and other methods (1%) (TABLE 36, FIGURE 28). The clinic sisters did not advise the use of coitus interruptus or spermicidal jelly or diaphragm and thus these methods were not enquired about. This does not imply that these methods were not used. This is a source of error in the study.

FIGURE 28

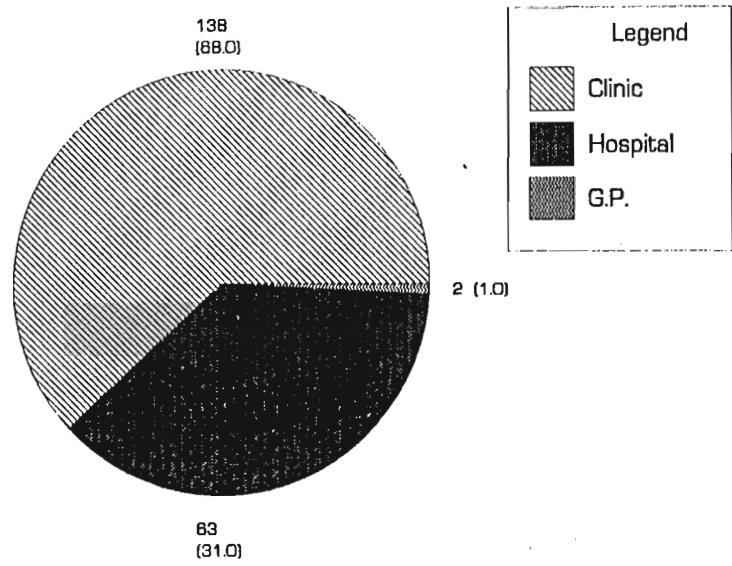


F. Place where Family Planning Service was Obtained

The source of the family planning services which were used by the 203 user women were:-
Clinic (68%), Hospital (31%) and General Practitioner (1%)
(TABLE 37, FIGURE 29).

FIGURE 29

Source of Family Planning
Number and Percent(%)



Health Facility

FEMALE EDUCATION

Two hundred females aged between 6-16 years were attending school compared to 182 males (TABLE 2). Thirty two (14%) of females in this age category were non-attenders.

One hundred and thirteen (14%) females of school going age and over 16 years of age had completed Std 7 level of education and 14% of females over the age of 6 years had received no formal education (FIGURE 14). A level of education of Std 8 or 9 would be required to read and understand a daily newspaper (communication with local headmaster).

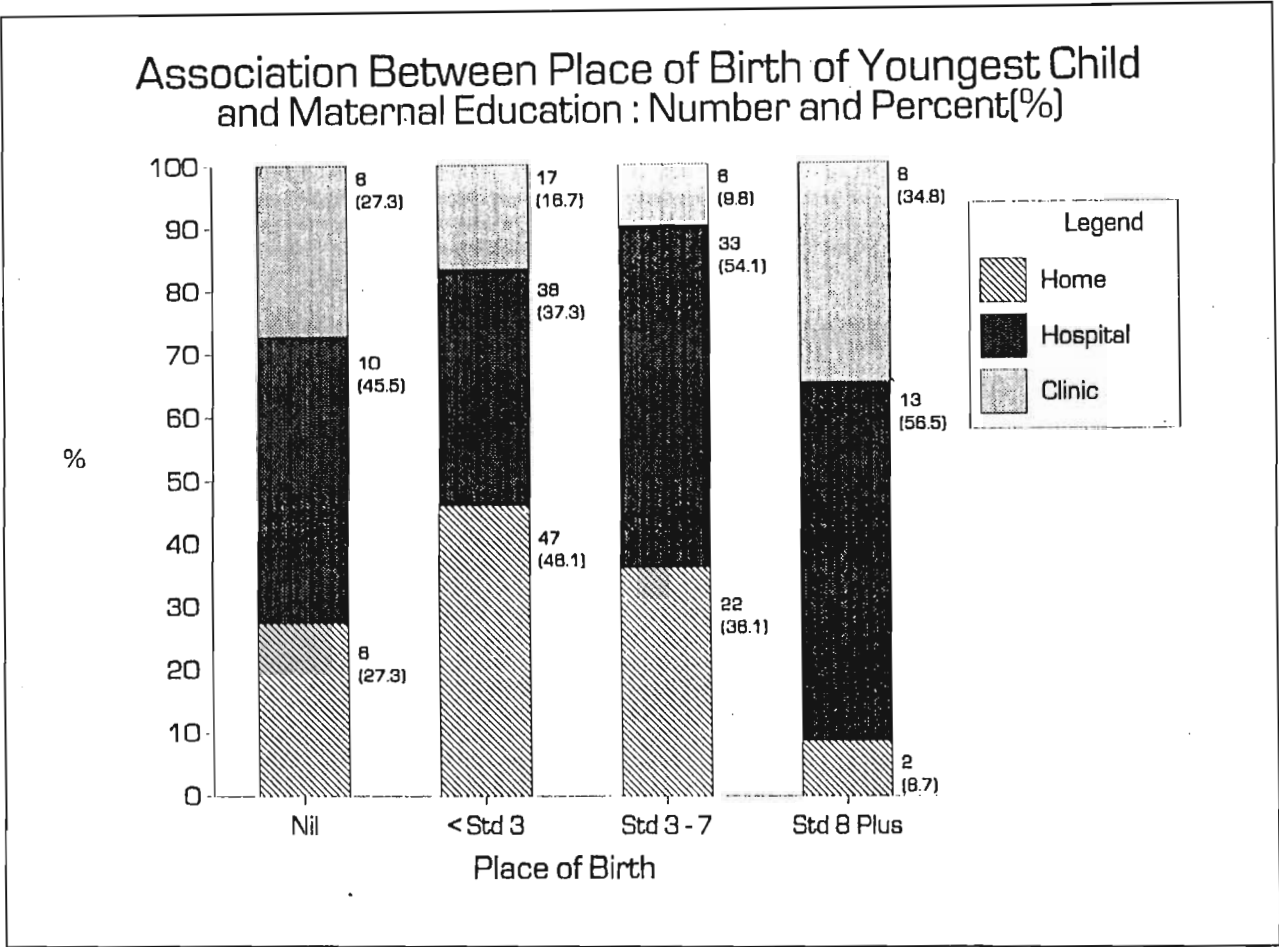
UTILISATION OF HEALTH FACILITIES

A. Association between Place of Birth of Youngest child and Education of Mother

Of the 204 children about whom information on the place of birth was obtained 77 (38%), 33 (16%) and 94 (46%) were born at Home, at a Clinic and in Hospital respectively (TABLE 38, FIGURE 30). (Information with respect to place of birth of 5 children was missing from the questionnaires.)

In considering the place of birth of children according to the educational status of the mother - of 120 women with less than Std 3 Education, 53 (44%) delivered at home compared with 69% of the 84 women with a higher level of education.

FIGURE 30



The association between place of delivery (home compared with clinic or hospital) and level of education (less than Std. 8 or Std. 8+) was not statistically significant, ($\chi^2_1 = 4.47$ ($0.04 > p > 0.03$)). (Std 8 for the purposes of this study was assumed to be the "literate" level.)

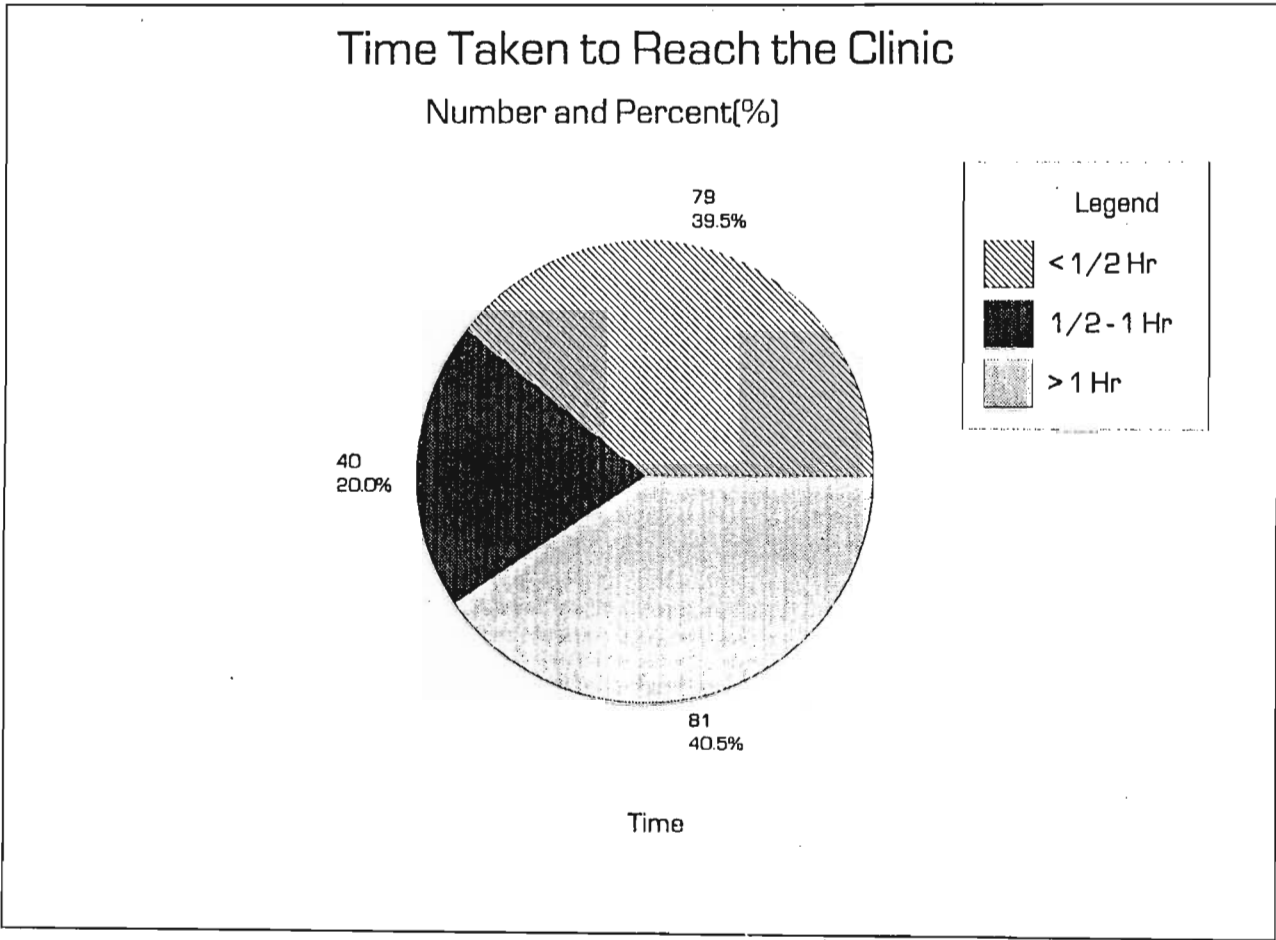
B. Time Taken to Reach Bomela Clinic

The time taken to reach Bomela Clinic was that given by the

household member interviewed and does not distinguish between walking or using mechanised transport to the clinic.

Of the 200 households, 79 (40%) lived within 1/2 hour of the clinic, 40 (20%) lived between 1/2 and 1 hour away, and 81 (41%) lived more than 1 hour away. (TABLE 39, FIGURE 31). It should be noted that all households were within 4 kilometres of the clinic as recommended by the World Health Organisation.

FIGURE 31



C. Health Facility of Choice for a Sick Child

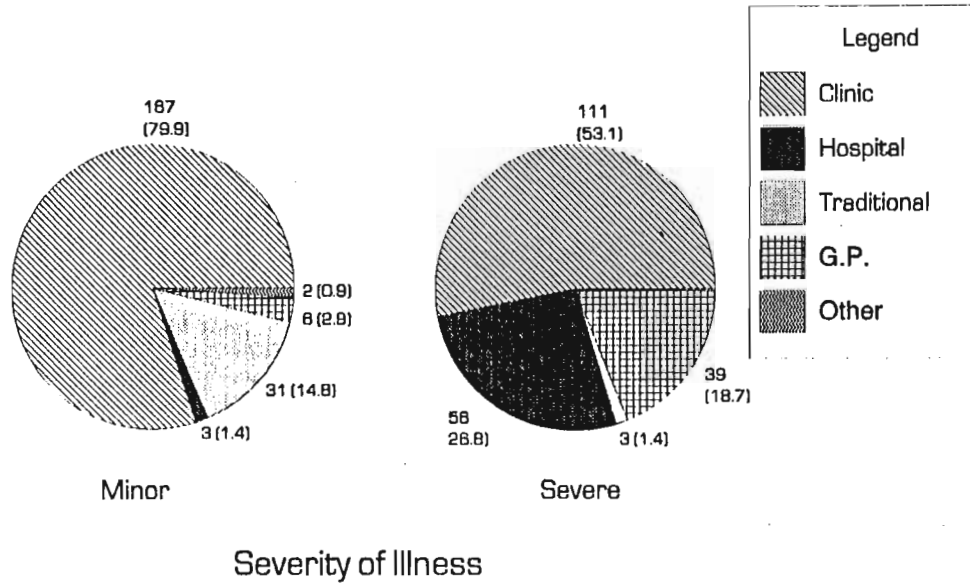
The health facility of first choice of the mother when one of her children under 6 years of age became ill was determined according to the severity of illness as perceived by the mother.

The results were as follows:-

1. Minor illness:- For the treatment of minor illnesses 167 (80%), 3 (2%), 6 (3%) and 31 (15%) chose the Clinic, Hospital, General Practitioner and Traditional Healer respectively (TABLE 40, FIGURE 32).
2. Severe illness:- The first choice for severe illnesses was the clinic for 111 (53%) of mothers, the hospital for 56 (27%), the private general practitioner for 39 (19%) and the traditional healer for 3 (1%).

FIGURE 32

**Health Facility of Choice for a Sick Child
According to Severity of Illness : Number and Percent(%)**

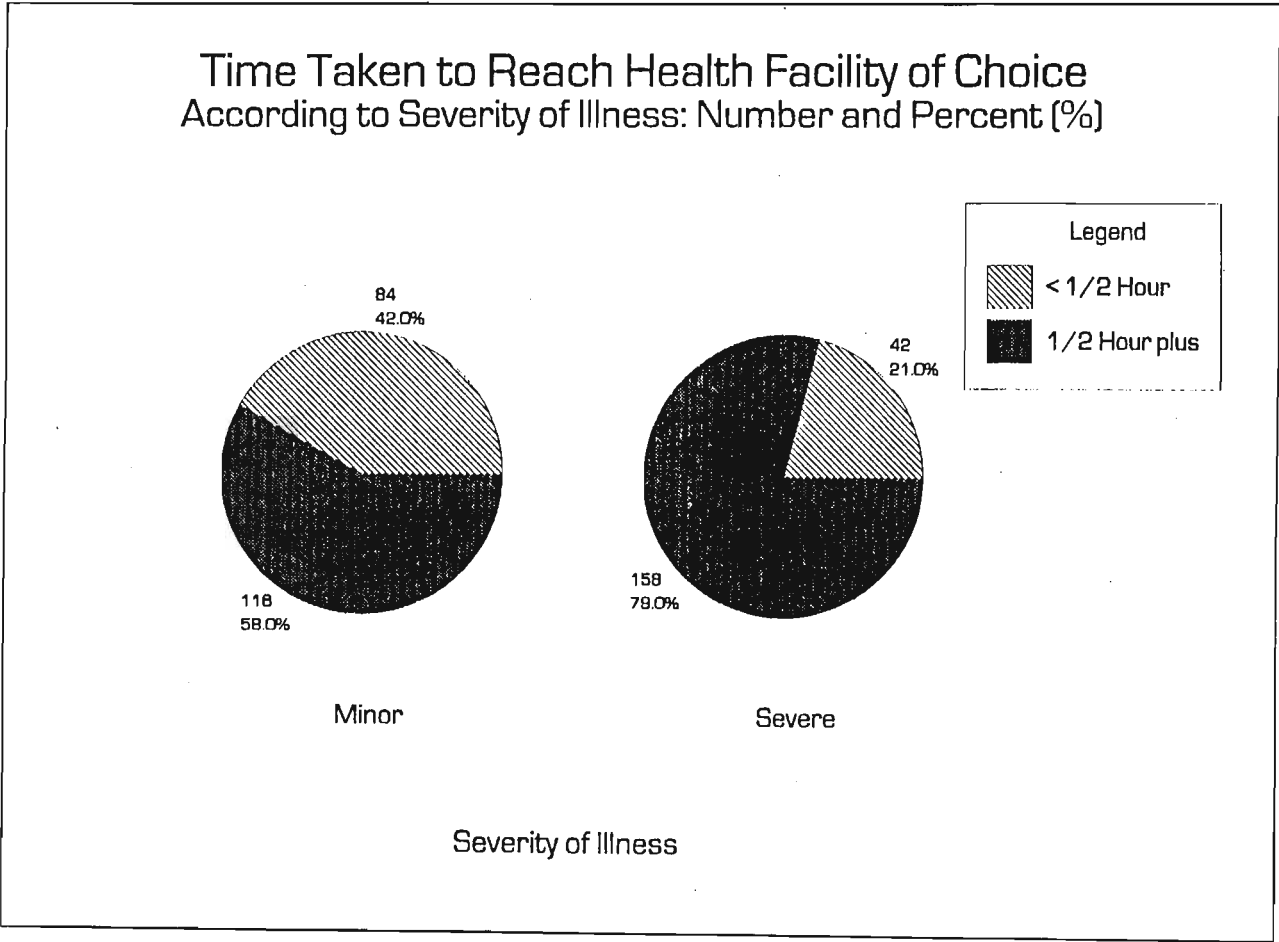


It is interesting that, in the case of minor illnesses, the traditional healer was more commonly preferred to the Private General Practitioner whereas in the case of severe illness the reverse was true.

D. Time taken to Reach Health Facility of Choice

The time taken to reach the local (Bomela) clinic is indicated in Figure 31 above. However the time taken to reach the health facility of first choice was more than 1/2 hour for 158 (79%) families in the case of severe illness and 116 (58%) families in the case of severe illness and 116 (58%) families for minor illnesses (TABLE 41, FIGURE 33).

FIGURE 33



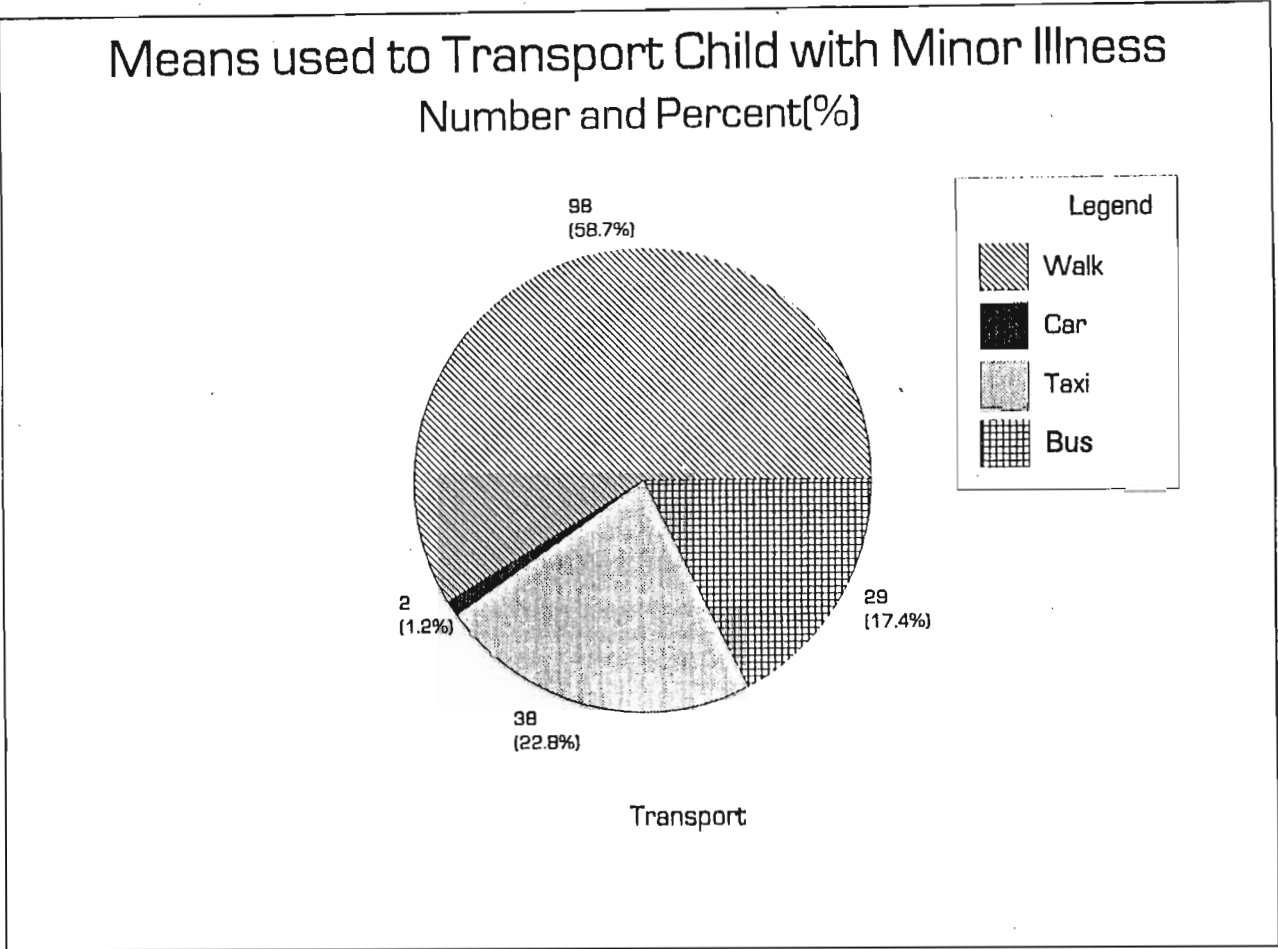
E. Transport to Health Facility of Choice (minor illness)

The form of transport which, it was reported, would be used to reach the chosen facilities was as follows:

1. Clinic:- 98 (59%), 38 (23%), 29 (17%) and 2 (1%) walked, used taxi, bus and private car respectively as the mode of transport.
2. Hospital:- 3 (100%) used the bus as the means of transport for a minor illness to hospital.
3. G.P.:- 4 (66%) and 2 (33%) used a taxi or bus respectively to attend a G.P. for minor illnesses.
4. Traditional Healer:- 28 (85%) and 5 (15%) walked and used taxi respectively to attend the Traditional Healer for minor illnesses.

Overall, however, 60% of people walked to the health facility of choice for a minor illness consultation (TABLE 42, FIGURE 33).

FIGURE 34



F. Transport to Health Facility of Choice (Major illness)

The form of transport which it was reported, would be used in respect of the chosen facilities was as follows:

- 1. Clinic:- 67 (60%), 29 (26%), 12 (11%), and 3 (3%) walked, used taxi, bus and private car respectively as the mode of transport.

2. Hospital:- 24 (43%) and 32 (57%) used bus and taxi respectively.
3. Traditional Healer:- 3 (100%) walked.
4. General Practitioner:- 16 (41%) and 23 (59%) used bus and taxi respectively.

Overall, however, 44% of mothers walked to the health facility of choice for a severe illness consultation, 39% utilized private combi/taxis and 24% used the public bus transport service (TABLE 43).

DISCUSSION

A. INTRODUCTION

This local community-based survey in the rural area of Bomela was undertaken to:-

- a. establish a baseline of data in respect of selected aspects relevant to Primary Health Care (PHC), namely GOBI-FFF, demography, and certain socio-economic and environmental facts which could be of relevance to the future health care planning of the area with an emphasis on Primary Health Care.
- b. ascertain the extent of use of the RTHC as a means of a family carried record system and from this to determine the future course of action to be used in determining progress towards the attainment of the UNICEF goal of "Health for All 2000" and the EPI goal of universal immunisation coverage (i.e. at least 90% coverage),
- c. determine priority areas in respect of basic amenities outside the Health Sector but directly linked to a community's health, such as sanitation, water and nutrition and,
- d. determine (in a small measure) the pattern of utilisation of health facilities of a community who are all within

4 kilometres of a primary care orientated clinic with a referral system to a community hospital (Murchison Hospital).

Health Care Managers and Health Authority Officials are becoming increasingly aware of the need to make health care delivery more responsive to fulfilling PHC needs.⁽¹⁸⁾ One method of achieving these objectives is to tackle the causes of morbidity and mortality via preventive and promotive health care. In order to assess priority areas for allocation of resources (money, manpower, materials - including time) it is essential that studies be carried out in local communities to obtain the information required for that area in order to facilitate appropriate management of resources and to enable subsequent evaluation of services. National data are useful for National planning but often do not reflect the situation at a local level.

B. STUDY TYPE

This study was descriptive in nature, household based and used interviews as the method of gaining the information required (i.e. Health interview survey). Main uses of this type of study are to quantify the extent of a health problem in a community and to establish baseline data to assist in health

care planning⁽¹⁹⁾ they are not of great value in evaluating health services. Interview surveys are discussed further during the Literature Survey (above).

C. THE SIZE, AGE AND SEX STRUCTURE OF THE BOMELA COMMUNITY

Based on the 11% (200 households out of 1 870) sample interviewed (see Method above), the population of Bomela, which forms a part of the catchment population of Murchison Hospital, is approximately 15 000. The 1985 RSA census was of no value in determining the population size for this area as the Bomela community was enumerated as a small part of the Magisterial District of Izingolweni and was part of one enumerator sub-district. This population of 15 000 is not the entire catchment population of the Bomela clinic, as an arbitrary line drawn on a map by the Management of Murchison and Port Shepstone Provincial Hospitals, has divided the Bomela clinic catchment area into two geographical zones. The size of the population which can potentially be referred to Port Shepstone Hospital is thus unknown.

It is relevant that the Bomela community is adjacent to a "White" farming area and many of the farm labourers and their families may also utilise the facilities available at the

clinic. The health status of this farming community is unknown as indeed is the size of the population living on these farms.

The age structure is typical of that found in developing countries with a relatively high percentage being under the age of 16 years (42%) and a relatively small percentage (3%) being over the age of 64 years (TABLE 1, FIGURE 1).

The male to female ratio was, as expected, approximately 1:1 for those under 16 years of age, (FIGURE 1). However, the Male : Female ratio in the 16 - 44 age group is 0,7 : 1. This age group includes the economically active sector of the population and this finding is expected due to the migration of labour to urban areas - despite the area of Port Shepstone (16 kms from Bomela) having been designated an area for decentralisation of industry.

The small number of people aged more than 64 years (3%) is typical of the profile of developing communities.

The age composition of a population determines, to a large extent, the social and economic activities (i.e. development) of that population, as well as its potential for growth. It was not possible to determine the average individual family unit size from the results of this "interview" study but there

was an average of 8,4 people living per household which compares with the estimated average Black family size of 7,5 in a study which stated "A high percentage of children can limit economic development, particularly in a population already caught up in a cycle of poverty, illiteracy, unemployment and a low standard of living".⁽⁴⁵⁾ In some households more than 1 family unit was residing. The results of this study showed that 41% of the population was under the age of 16 (TABLE 1). This relatively "young" community will "demand" health care of a different nature to an "older" (developed) community and facilities such as maternal and child health services, creches and pre-school care, schools and recreational facilities should receive priority over e.g. old age home and retirement centres. Younger populations also create demand for increased jobs and organised commerce and industry will play a vital role in meeting the demand, as will current efforts at deregulation to allow the informal sector of the economy to expand.

D. SOCIO-ECONOMIC STATUS

The "dependency ratio" of 49% for the community (0 - 15 years + >64 years + Disabled/16 -64 years) is a disturbing feature - and it should be remembered that this figure excludes the unemployed aged from 16 to 64 years (TABLE 2, FIGURE 2). A

high "dependency ratio" places strains on resources at local community and national levels and methods of decreasing this ratio should be given priority amongst Health and Population Development Programme planners alike.

The unemployment rate of the community as a whole was 26% (TABLES 2 & 3, FIGURE 3) with the ratio of female to male unemployment in the community being 3 : 1 (age group 16 - 44 years). However, the rate of unemployment in the "employable" age group (16 - 44 yrs) was 46%, with unemployment for males (aged 16 - 44 yrs) being 30% and females (aged 16 - 44 yrs) being 58%. These rates are very high and should be a cause for concern, as unemployment has a retarding effect on any Development Programme for a community. People advocating sanctions will ultimately be held responsible to a degree for this, but one should not forget that Apartheid itself has created unequal opportunities and retarded social and economic development in Black communities.

In respect of education, the results of the study show that only 13% of the community have achieved more than Std. 7 education (TABLE 4, FIGURE 4). Personal communication with a local headmaster would have the researcher believe that Std. 8 or 9 education would be required to read and understand a daily newspaper. This figure should be compared with the estimated national figures of 44% of Whites, 14% of Asians,

4% of Coloureds and 1,5% of Blacks with a post-Matric education.⁽⁴⁵⁾ The results of this study showed that 1% of the community had attained Std. 10 education. However, it should be borne in mind that the study did not include those members of a family residing or working away from the local community - who may have been the family members with a better standard of education, (this was a source of Bias in the study). Nevertheless the status of those resident in the area is important and the above "literacy level" was unsatisfactory. Education, as an important component of PHC, is to be regarded as a priority for the area and every effort should be made to upgrade and extend existing facilities.

A disturbing feature of the results was also the finding that 18% of children aged 6 - 16 yrs were not attending school (TABLE 3, FIGURE 2). Basic education programme contents and methods - aimed at primary education, literacy and non-formal education programmes for youth and adults should be aimed at a community's needs and priorities. Perhaps then, those in rural areas will be motivated to attend school.⁽⁴⁶⁾ (See Discussion on Socio-economic Profile and Female Education in Literature Survey above).

When economic activity in the age group 16 - 44 years was compared with standard of education attained it was found to be statistically significant ($p < 0.01$) that 64% of those with

< Std. 5 education were unemployed (TABLE 3, FIGURE 3), whereas 38% of those with Std.5+ education were unemployed. Once again this would appear to confirm the importance of a comprehensive Population Development Programme involving improvement of all facilities including health and education if the quality of life of a community is to be uplifted, and ultimately a stable population growth rate is to be attained. The education crisis in the Black community needs to be addressed urgently.

There was no significant association between sex and standard of education attained in this community (TABLE 4, FIGURE 4) - but one must consider that urban migration of males may have lead to bias in this result. This compared favourably with many developing areas of the world, where females are at a disadvantage in terms of access to education, (see Literature Survey on Female Education).

It was found that on average there were 8,4 people per household in the study sample. (1 682 people/200 households) (TABLE 5). The "crowding index" - estimated by taking the number of residents who slept in the house the night prior to the interview and dividing this by the number of rooms used for sleeping - was 3. This "picture" is commonly seen in poor, underdeveloped areas and is a major contributor to the spread of infectious diseases such as measles, polio, TB and

scabies, not to mention the incalculable social harm that may be caused by people of both sexes and all age groups living together in the same room. Again the importance of adequate housing is illustrated and surely is a priority in many areas of the RSA as it is in other under-developed areas of the world.⁽¹⁵²⁾

E. ENVIRONMENTAL CIRCUMSTANCES

1. Household Sanitation

The key role of water, sanitation, sewerage and housing was stressed at a conference hosted by the Medical Research Council (RSA) in 1987 - entitled "Community-based essential health care services in Southern Africa".⁽¹⁵²⁾ The National Health Services Facilities Plan (NHSFP) of RSA makes provision at the first level for the delivery of these basic needs. In this study 76 (38%) households (TABLE 6, FIGURE 5) had no access to any form of toilet facility other than the surrounding terrain. It is relevant that the remaining 62% often shared a toilet facility with other households and thus, of necessity, on occasion would have to use the ground around the houses. This figure is unsatisfactory and efforts to improve sanitation facilities should be

encouraged and given priority in the community. The tribal chief in the area is now imposing cash fines on households without a toilet facility but one hesitates to recommend this as the best method of motivating a community to build and use toilets. If people are to enjoy "good" health they must live in "good" surrounds and one of the essential items is adequate sanitation. It remains to be seen in RSA, how the first level of the NHSFP will be implemented in rural areas such as Bomela. (For further discussion on this aspect, see Literature Survey.) It is interesting that, in Cuba, the mortality figures for gastroenteritis decreased from 58,1 per 100 000 in 1962 (when 35% of the population had adequate water and sanitation) to 9,7 per 100 000 in 1973 (when 60% of the rural population had adequate water and sanitation).⁽¹⁵⁶⁾

The association between standard of education for the household head and the absence or presence of a toilet facility was statistically highly significant, (see Results) once again stressing the importance of education as a component of PHC (TABLE 7, FIGURE 5). Education may imply improved health knowledge or improved economic circumstances permitting the building of a latrine facility.

ii. Presence of Refuse Disposal Facility

The presence of a refuse disposal facility occurred in 141 (70%) of households. This figure was similar to that for the availability of sanitation facilities. There was no statistically significant association between the presence of toilet facilities in a household and the presence of a refuse disposal facility (TABLE 8). This may suggest that economic status again plays a role as refuse pits do not cost money, but the study did not compare educational levels with the presence or absence of refuse disposal facilities.

iii. Water Source

The main source of water (for drinking and washing) for the community were springs which were used by 127 households (64%). Six of the springs are presently "protected" under a scheme supervised by the KwaZulu Government (TABLE 9, FIGURE 6). A further 54 households (27%) used streams in the community.

One of the 12 Global indicators to be used for monitoring and evaluating "HFA 2000" is that safe water should be in the home or within 15 minutes of the home.⁽¹⁵⁰⁾ In this survey 159 (80%) of households (TABLE 10, FIGURE 7) lived

more than 200 metres from the main source of water and thus the majority do not yet have adequate access to water according to the WHO standard (above). One assessed, subjectively, that to walk to and from a water source at least 200 metres away and to fill the containers would take at least 15 minutes.

The facts that 64% of households used springs as a water source and that within 1 year of commissioning, 1 out of the 2 boreholes in the community was broken so that water could not be obtained from it, suggests that for the present the concept of "spring protection" may be a preferable means of providing the community with water which is both accessible and of acceptable quality - especially where springs are in abundance, and do not dry up in winter (dry months). It is possible to "protect" about 8 springs for the cost of 1 borehole (+/- R6 000), and maintenance of protected springs poses less of a problem.

A study in 50 of the poorest nations in the world showed that only 6 countries were in a position where more than 40% of their population had access to safe water - the figure was lower for rural areas.⁽¹⁵⁵⁾ Springs can be adequately protected and the programme of "spring protection" already initiated should be encouraged and

increased. (For further Discussion on Water see Literature Survey).

iv. Gardens in the Community

Out of the 200 households interviewed, 71 (40%) had no garden (i.e. did not grow at least 2 vegetables other than maize) and 106 (53%) possessed their own garden. Twenty-three households were involved in communal garden schemes and since the completion of this study not less than 3 such schemes have been introduced to this community by the KwaZulu Department of Agriculture (TABLE 11).

One of the prime causes of infant death in developing countries is low birth weight (LBW),⁽¹³⁹⁾ and it is thought by some that conception does not take place unless the mother possesses a certain amount of energy reserve. In a well nourished mother, a transfer of energy to the infant occurs which is thought to "buffer" the infant during the critical weaning period. Thus poor maternal nutrition leads to poor maternal energy reserves and a low foetal fat reserve.⁽¹⁴¹⁾ Several studies have shown that by simply using locally available food products the nutrition of mothers and infants could be improved.⁽¹⁴⁰⁾ For example, the bean which is easily grown, is

culturally acceptable and is high in protein and energy reserves, could be more effectively and efficiently utilised.

Policies which would enable women to spend more time on food production would contribute to enhancing child survival and preventing malnutrition such as including women in farmer training programmes and the continuation of schemes by the Department of Agriculture to encourage communal garden schemes.

A secondary benefit of communal garden schemes is the profit which can be made through selling excess vegetables for cash or bartering - as happens at the Valley Trust (Botha's Hill, Natal) - (personal observation).

A tertiary benefit is that members of a community become united in purpose and community participation becomes meaningful. Women's associations can be formed and these may be able to permit women to play a more meaningful role in community development.

Without home growing of vegetables and fruit it is difficult to conceive how a mother can adequately feed 3 or 4 children and herself on earnings of between R100 -

R200 per month - even if she is being "health educated" regarding nutrition. (For further more detailed discussion see Literature Survey).

F. MORBIDITY AND MORTALITY INFORMATION FOR CHILDREN OF 5 YEARS AND UNDER

i. Episodes of "significant Morbidity in the previous 6 months."

"Significant" Morbidity was used for episodes of illness for which the mother "sought" health care outside the home, for one of the "selected conditions" (see Annexure B).

Pneumonia and Whooping cough, Gastroenteritis and Measles accounted for 36%, 13%, and 11% of episodes respectively (TABLE 12, FIGURE 9). The high prevalence of whooping cough, (11%), could be an error of diagnosis as this condition is difficult to diagnose on a clinical basis and the "recall" period of 6 months could have led to mothers assuming that the episode of Respiratory infection had lasted longer than 4 weeks (see definitions used in Zulu in Annexure B) and a child may vomit after a cough in respiratory conditions other than Pertussis.

"Other", as a cause of a morbidity episodes accounted for 35% of cases and included - "unknown", paraffin ingestion, burns and parasitic infestation.

The "picture" noted above is what one would expect to find in rural underdeveloped communities and it is of interest that 24% of these "known" episodes (measles and gastroenteritis) can be prevented by immunisation (measles) and hygienic home conditions, breast feeding and good quality and quantity of water (gastroenteritis). When one realises that measles killed an estimated 2 million children world-wide in 1985⁽⁷⁶⁾ and gastroenteritis is "the greatest single killer of children in the developing world - and often the chief cause of childhood malnutrition",⁽⁵⁶⁾ it becomes a challenge for the health services in the Bomela area to tackle and alleviate the conditions which lead to measles and gastroenteritis (see Discussion in the Literature Survey on ORT and Immunisation). The "health profile" of Bomela remains one of a developing community, despite a clinic being accessible on a 24 hour basis within 4 kilometres of each household interviewed. This would suggest:-

- a. the mere presence of a health facility in a community does not "improve" a community's health profile,

- b. facilities other than those dealing purely with health are required - i.e. the health team concept must be utilised and,
- c. a co-ordinated programme of community development is needed in the Bomela area involving health, education, immunisation, improved housing and water, i.e. the National Health Services Facilities Plan (NHSFP) must be implemented effectively as soon as possible at the first level.

There was a statistically significant association between the prevalence of gastroenteritis in children and their ages. Those aged 2 years and less showing a higher prevalence compared with those aged 3 years or more, $\chi^2_1 = 6,01$ ($p < 0,01$) (TABLE 12). There was no statistically significant association in the prevalence for age of other "selected conditions" (TABLE 12).

Of the 75 episodes listed under "Other" (TABLE 12) - there was noted to be 31 (41%) episodes of "worms" (parasites), 9 episodes of paraffin ingestion and 13 episodes of burns. Parasite infestation, being associated with poor hygiene and lack of washing water being available in adequate quantities to children should direct attention to the provision of safe and adequate water supplies and hygiene, while paraffin ingestion and

burns indicate a need for preventive health education programmes directed to home-safety measures.

ii. Episodes of Mortality in children under 6 years (recall period = 5 years).

The "recall" period of 5 years is long and it is accepted that this is a limitation of the study. However, it was considered that most deaths would be recalled as the death of a child is a major traumatic event in any family. The recall period of 5 years may account for the high percent (22%) of deaths (n=21) noted as of "unknown" cause (TABLE 13, FIGURE 10).

The long recall period does not allow an accurate estimate of the Infant Mortality Rate (IMR) or the "under - 5 Mortality Rate ("U5MR"). In addition a large influx of people from neighbouring Transkei has occurred in the last 5 years, in search of employment and health services and this makes the estimation of a denominator for local births and deaths difficult.

The known causes of death reported were Pneumonia, Gastroenteritis and Measles being responsible for 30%, 28% and 21% of deaths respectively (TABLE 13 FIGURE 10).

The "mortality profile" was again that of one seen in developing communities where it is estimated that a child dies of measles world-wide every 15 seconds⁽⁸²⁾ and that diarrhoea is the single biggest killer of children.⁽⁵⁶⁾ A study carried out in 1970 in RSA, listed measles as the 7th leading cause of death among African Children,⁽⁸⁵⁾ and thus it would appear that in 1987 the "picture" for the Bomela community had changed little.

Sixty one out of 97 (63%) deaths recalled were in children under 1 year of age. Although unquantified, this would suggest that the IMR remains unacceptably high. If this is the case, and because the IMR is a good indicator of socio-economic status, it may be cautiously extrapolated that the general quality of health service and, indeed, the quality of life of the Bomela community as a whole is less than acceptable.

Seventy percent of deaths due to Measles, 85% of deaths due to G/E and 52% of deaths due to pneumonia occurred in children < 1 year old (TABLE 13). One is not able to assess from this study the number of pneumonia deaths which were secondary to measles.

The relatively large number of "Other" causes of death, (TABLE 13, FIGURE 10) may be attributable, at least in

part, to:

- a. long recall period (5 years),
- b. lack of communication between health worker and mother or family,
- c. a "fear" of attributing cultural practises e.g. enemas or purgative administration to young children as a cause of death and,
- d. mothers genuinely not knowing what caused a young neonate to die.

It is of concern, that 68% of known causes of death occurred to children under 1 year of age, suggesting a high IMR in the community in the previous 5 years (but one cannot from these results deduce that the current IMR is still high or, for that matter, has reduced). Some of the possible reasons for this were mentioned above. It should also be borne in mind that 38% of the babies were born at home (TABLE 38) and thus a number of these infants may not be reaching a health facility before their demise.

The picture above leads one to question why in 1987, children within 4 kilometres of a clinic service and living within 20 kilometres of a major Natal town in RSA (Port Shepstone) were still dying of diseases of the

under-developed "poor nations"? If one can answer this question then action must be taken to alleviate the problem and, if one cannot answer the question, it is the responsibility of people concerned with community development to discover through appropriate research the reasons for the Bomela community's adherence to this "mortality profile" and then to take appropriate action.

Priority diseases to concentrate on would seem to be gastroenteritis, measles and pneumonia prevention, coupled with increased delivery of babies in a health facility or "carefully" supervised home deliveries. A home delivery service would however, require an appreciable increase in manpower and its training.

iii. Place of Death of Children under 6 years of age.

Forty-eight (49%) deaths were reported to have occurred at home, (TABLE 14). It is not known how many of the children who reportedly died at home had previously attended a clinic or hospital for treatment prior to death.

It is sobering to think that of the 61 reported infant deaths (TABLE 14), 36 (59%) occurred at home. Under these circumstances accurate recording of births, deaths

and the causes of the latter become difficult. The estimation of IMR and NMR is therefore difficult in such a rural community as Bomela - notwithstanding the added problem of migration into the area from the Transkei.

Infant deaths accounted for 63% of "recalled" deaths of children under 6 years of age. This would again, suggest a high IMR and the factors associated with that in the community.

The caution necessary in interpreting "official" birth and death rates is again brought into focus and methods of improving utilisation of existing health facilities and of improving data and information collection must be sought. Without accurate, relevant information it is very difficult for all involved in PHC to plan programmes distribute resources and to evaluate. Ideally mortality, morbidity and fertility rates should be easily accessible and reliable for use by both local and central planners.

Studies should be carried out to identify the factors associated with infant deaths e.g. accessibility to health care, unacceptability of services or staff, culturally determined characteristics, etc. The present study is not directed to providing the answers to these important questions.

G. COMMUNITY AWARENESS AND PRACTISE OF GOBI-FFF

i. Growth Monitoring

a. The RTHC was the main record source used in this study to assess:-

1. growth monitoring and,
2. immunisation status.

Increased acceptance of the PHC principle and improved communication possibilities have enabled parents and communities to potentially become more effective as health workers in themselves and so bring about improvement in their childrens' quantity and quality of life. Growth monitoring with a RTHC is one of the GOBI-FFF (PHC) techniques.

RTHCs, if used effectively, can detect malnutrition and poor growth at an early stage and thus prevent the costly and often unsuccessful treatment of "established malnutrition". UNICEF believes that "growth monitoring is probably the most essential step towards the eradication of childhood malnutrition in our times".⁽⁴⁹⁾ (See Literature Survey on Growth Monitoring).

Out of 312 children (under 6 years of age) about whom

details of RTHCs were obtained, 209 (67%) possessed a RTHC. An encouraging aspect was that a RTHC was present for 88% of those children aged 2 years and younger (TABLE 15, FIGURE 11). This increased presence (in comparison to those aged over years) of RTHCs in the younger age group was statistically significant and may be a sign that RTHCs are gaining increased acceptance by health staff and community in the last few years or may suggest that after the age of 2 - 3 years RTHCs are not regarded as being of importance. One cannot determine the reason for the above findings from this study and it would have been interesting to see if in 1989 the children aged four years or five years had retained the RTHC which was present for them in 1987. However, RTHC's were present to a high degree in the young children of the Bomela community and this is a good foundation to build upon for their correct use (see Literature Survey on Growth Monitoring). It should be remembered that the mere presence of a RTHC does not lead to improved growth monitoring or nutritional status assessment (see below).

b. Completeness of RTHCs

This was assessed by checking the growth curve recorded, action taken if and when required and on the immunisation

record. The maternal and other details were not studied on the RTHC. It was found that 88 out of 196 (42%) were complete-for-age (TABLE 16, FIGURE 12). This figure may seem low but one feels that it is a good foundation to build upon in the community in the future, to stress the usefulness and importance of RTHCs. It should be remembered that a study carried out in the RSA noted that "no-one had explained it's (RTHC) purpose to approximately half the parents or care-takers".⁽⁵⁴⁾ Thus education of health workers must be seen as a priority in respect of RTHCs - a fact borne out by personal experience of the researcher whilst carrying out "in-service" training at peripheral clinics - where a surprising lack of basic knowledge is apparent amongst even recent graduates of nursing colleges. Secondly - another priority must be the participation of mothers in the keeping of RTHC information up-to-date (see Literature Survey on RTHC and Growth Monitoring).

ii. Oral Rehydration Therapy (ORT)

a. Awareness of ORT

In 121 out of 200 households (61%) there was some awareness (i.e. "heard of") of ORT as a method of

knew how to make ORS ("Sorol" and/or glucose and salt solution). This percentage of households who were able to make ORS is too low when one considers the considerable morbidity and mortality which gastroenteritis still causes.

(See more detailed discussion on ORT in Literature Survey).

c. Use of ORT by households who knew how to make ORS

Knowledge of making ORS does not necessarily lead to the practise of ORT in gastroenteritis - as the results of this study would suggest. Only 19 (26%) out of a possible 74 households had used ORT in episodes of gastroenteritis, and, subjectively, one would believe that more than 26% of the households would have had opportunity to use ORT on at least one occasion (TABLE 19, FIGURE 13).

These results would suggest that an increased "drive" to motivate and train clinic staff is required and involvement of mothers in an on-going repeated education and training programme in the use of ORT should receive attention. Another aspect to be considered, would be the utilisation of more non-

medical staff to train and encourage mothers in the use of ORT, which proved effective in a programme initiated in Tonga.⁽⁶⁹⁾ There is much room for improvement in ORT knowledge and use in the Bomela community. However the problem of "old customs" for "old problems" makes the acceptance of this ORT very difficult to achieve amongst poor rural communities.

(For more detailed discussion see Literature Survey.)

d. Association between Education of Mother and Knowledge of making ORS

There was a statistically significant association ($p < 0,01$) between the educational level of those mothers who knew how to make ORS and those who did not (TABLE 21, FIGURE 14). This would suggest once again, the importance of Female Literacy (education) in the GOBI-FFF strategy.

UNICEF⁽¹³⁵⁾ lists education (of women) as one of the priorities in enabling poor people to develop or improve their quality of life in difficult circumstances. Female education has been

demonstrated to be associated with declines in IMR and also declining fertility rates⁽¹³⁶⁾

Why this association (education and knowledge on making ORS) is so, is not easy to determine. Mothers with lower levels of education (< Std 3) may be under more "cultural" or family pressure (from grandmother or aunts) to avoid the use of ORT or mothers with more education (Std 3+) may be more informed and more ready to "accept" change.

(For more detailed discussion on Female Education see Literature Survey).

iii. Breast Feeding

a. Breast feeding Prevalence

It has been shown that Breast feeding increases the survival chances of infants.^(62,63) It is one of the basic UNICEF strategies in GOBI-FFF.

Information on Breast feeding was obtained for 341 children in the Bomela community (TABLE 22, FIGURE 15). The results showed that 16 (5%) had never been "breast fed" or had been breast fed for

less than 1 month and a further 48 (14%) had received breast milk for between 1 and 3 months - i.e. 19% of infants had received less than 4 months of breast feeding. One is encouraged by this result, which compares favourably with another study in RSA⁽⁶⁷⁾ where 18% of White mothers in Pretoria and 25% of Black mothers in KwaZulu (Urban/"Peri-urban") were breast feeding at 3 months.

Personal experience at rural clinics would support this finding of an increased support for breast feeding. One does not see (subjectively), as many dirty bottles of "milk substitute" these days as one would have seen in the early 1980's.

However, continued "education" on the importance of breast feeding must be encouraged and Health Workers, traditional birth attendants and Community leaders must be appropriately informed regarding breast feeding. One feels (personally) that the stopping of advertising milk substitutes in the clinic was a step in the right direction and is to be commended.

b. Reasons for stopping Breast feeding

Weaning in this study refers to the cessation of Breast feeding AT 9 months or greater age and purely for "natural" weaning. Occassionally a mother stopped Breast Feeding after 9 months for unnatural reasons e.g. abscess.

The reasons given for stopping breast feeding were, in descending order, given as weaning (52%), mother working (17%), "not enough milk" (16%) and "no milk" (4%).

It is accepted that in an interview situation where sensitive issues are discussed - the truth or "whole truth" may be difficult to obtain at all times. Thus the mothers interviewed may well have used the term "no milk" or "not enough milk" instead of admitting a preference for milk substitutes, knowing that this answer may well have been more acceptable. Subjectively (personal experience), one feels that the <1% use of milk substitute reported in this study to be an underestimate.

It is encouraging to note that weaning (complete

cessation of breast milk), was offered as a reason for stopping breast feeding, after the age of 9 months in 97% of cases (TABLE 22, FIGURE 16) and that 189 (55%) of babies were Breast Fed for at least 9 months.

A mother going to work was given as the reason for stopping Breast feeding in 17% of cases. The high unemployment rate of women in this community (> 50%) may have contributed to this figure being lower than what one would have anticipated. Thus breast feeding for longer periods may be one of the few beneficial results of unemployment among women. However, this does not take away, from employers, the responsibility of making facilities available for nursing mothers and such schemes must continue to be encouraged in industry.

The low recorded rate of use of milk substitute (<1%) may be due to a number of factors such as:-

- a) decline in popularity of milk powder,
- b) economic considerations - bearing in mind the adverse economic situation in the area,
- c) decreased advertising of these substances in the clinics and other health facilities or
- d) a reluctance on the part of the mothers to

admit to the use of milk substitutes.

Breast feeding in the Bomela community would not appear to be a problem judging by the results obtained in this study. (See Literature Survey).

iv. Immunisation

- a. Overall status of Immunisation (children < 6 years)
(Excluding BCG vaccine coverage)

Sample size was 312 children.

Immunisation status was known, from RTHC records, to be complete (for age) in 84 (28%) children and incomplete in a further 102 (33%). One hundred and eighty six (60%) children have had at least some exposure to the vaccination programme.

The immunisation status was unknown in 126 (40%) cases i.e. no RTHC (or home-based clinic record) available (TABLE 23, FIGURE 17).

"Worst-case" coverage (assuming unknown status to be NOT vaccinated) thus works out to be 60%.

NOTE:- BCG coverage was treated separately as the presence or absence of a scar was used for record purposes for this vaccine.

It is estimated that 3 million deaths to children (under 6 yrs) could be prevented annually, by immunisation against the six major diseases (for which vaccines are routinely available in RSA),⁽⁷⁴⁾ and yet this "chronic" emergency (as it is called by UNICEF) continues, with most governments spending more on Defence budgets than Health Care. UNICEF estimates that to immunize 80% of all the world's children would cost approximately the same as 5 advanced fighter jets.⁽⁷⁴⁾ The results of this study (performed in 1987) show that the overall complete coverage (in Bomela) of at least 27% compares with the estimated world-wide figure of 40% immunized against TB, DWT and Polio and an estimated 26% against Measles (1986) (cf to 35% in Bomela).⁽⁷⁸⁾ Thus, from this one sees that this rural area in RSA appeared to be on "a par" with world average - not satisfactory if at least 80% coverage is to be attained by 1990 (EPI target). The proliferation and fragmentation of health care delivering authorities in RSA will not make planning, co-ordinating and implementing a uniform and universal immunisation programme easier. In 19 Caribbean countries, a designated "immunisation programme" manager has been utilized with success - showing that by 1985, 12 out of the 19 countries had

achieved over 75% coverage (cf to only 2 of these countries with over 50% coverage in 1979).⁽⁸³⁾ The situation is very difficult in a region so fragmented as Southern Africa and perhaps health managers and politicians should take note of such examples as the Caribbean, when planning future policy. For instance, one section of the Bomela community studied was visited by a mobile clinic team, managed by the Natal Provincial Administration (previously DNHPD), while the clinic is managed by the KwaZulu Department of Health - only 3 kilometres away - with no regular interaction between the two health teams. This situation should not be allowed to continue in its present format.

The overall immunisation status in the Bomela community is on a par with some other developing countries but remains unsatisfactory. Increasing coverage for all vaccines should remain a priority and perhaps increased penetration of health workers into the community would facilitate increased coverage to attain the EPI target of at least 80%.

Another important step towards improving overall coverage would be to design vaccines to be delivered at birth and all at one time, without the present

"staggered" attendance required. The earlier the vaccines could be administered, e.g. birth or first contact with health facility, the better.

(For more detailed discussion on Immunisation see Literature Survey.)

b. BCG immunisation status

The sample size (children aged less than 6 yrs) was 312.

Two hundred and fifty (80%) children showed evidence of having a BCG scar on the upper arm, (TABLE 24, FIGURE 18).

It was interesting to note that there was no statistically significant association between BCG coverage and age of child.

This may show the advantage of "compulsory" vaccination (compulsory in the RSA since 1973), or alternately, may indicate no change in utilization of health service facilities over the 3 year period. BCG vaccine administration has an advantage over

other vaccines in that:-

- a. it is administered at birth or as soon as possible thereafter, thus children may be vaccinated at a clinic against TB at first attendance - even if delivered at home, and
- b. it is compulsory and this may make health workers more "conscientious" in its administration, (however it is no longer compulsory by law since 1986).

BCG vaccination is compulsory in 64 countries and officially recommended in a further 118.

The estimated 80% BCG coverage in Bomela compares with an estimated 68% in the RSA in 1983 based on official statistics.⁽¹¹⁸⁾ This 80% coverage is encouraging as far as the BCG immunisation programme is concerned - and the EPI target has been reached for BCG (in Bomela).

(For a more detailed discussion on BCG immunisation see Literature Survey.)

c. Measles Immunisation Status

The results were based on RTHC records (or home-

based clinic cards) of 312 children (less than 6yrs of age).

The known (i.e. record available on RTHC or patient carried clinic record) overall coverage for children over 1 year old was 23% (TABLE 25, FIGURE 19).

From the RTHC record, 51 (21%) of the children of 1 year and over had not been immunized, (Measles vaccine should be administered at 9 months) and the immunisation status of 50% of the children over 11 months of age was unknown -due to absence of a RTHC (TABLE 25, FIGURE 19).

A limitation of this study was that the coverage for measles vaccine, of those children aged between 9-12 months remains unknown due to questionnaire design not permitting a breakdown of those children aged less than 1 year. A knowledge of the children aged 9 months who had been vaccinated against measles would have been useful as the rural Black children are regarded as "high risk" and the vaccine should thus be given at 9 months. However, by the age of 1 year all children should have been immunized.

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From the RTHC record, 51 (21%) of the children of 1 year and over had not been immunized, (Measles vaccine should be administered at 9 months) and the immunisation status of 50% of the children over 11 months of age was unknown -due to absence of a RTHC (TABLE 25, FIGURE 19).

A limitation of this study was that the coverage for measles vaccine, of those children aged between 9-12 months remains unknown due to questionnaire design not permitting a breakdown of those children aged less than 1 year. A knowledge of the children aged 9 months who had been vaccinated against measles would have been useful as the rural Black children are regarded as "high risk" and the vaccine should thus be given at 9 months. However, by the age of 1 year all children should have been immunized.

An estimated 2 million children die of measles annually⁽⁸²⁾ and in 1970 (in the RSA), measles ranked as the 6th leading cause of death for Coloured and Asian children and the 7th leading cause of death in African children (official statistics).⁽⁸⁵⁾

Measles is highly contagious and all children will become infected, unless vaccinated. The disease became notifiable in the RSA in 1979, but gross under-reporting is thought to occur e.g. notified deaths from measles in 1984 was 239 compared to registered deaths from measles at 998.⁽⁸⁸⁾

A study in another area of KwaZulu⁽⁹⁴⁾ revealed that between 47-56% of children had received 1 dose of vaccine compared to Bomela with a known coverage of 30% and 47% unknown. As was pointed out earlier this study used the RTHC vaccination record to determine immunisation status - a limitation of the study - but the researcher wished to gain some insight into the value and utilisation of the RTHC as an information base for immunisations in a community (as this is one of the purposes of the RTHC in PHC).

The known coverage of 23% (over the age of 11

months) in this study is unsatisfactory because:-

- a. 23% is far short of the 80% level needed to attain "herd immunity", assuming "UNKNOWNNS" in this study were not immunized or
- b. 23% may indicate that the RTHC at present is not functioning adequately as a useful information source for measles vaccine coverage (or indeed other vaccines).

In either event the problem needs to be tackled and ways sought of improving the measles vaccination programme and/or improving the utilization of the RTHC as a "recording instrument".

Once again, one cannot over emphasize the importance of continuing and improving the effectiveness of the current immunisation programme so as to attain the "target" of coverage, set by the EPI.

(See more detailed discussions on RTHCs and measles immunisation in the Literature Survey).

d. Polio Immunisation Status

(It should be noted that the study was completed 4-5 months prior to an epidemic of Polio (1987/88)

which affected KwaZulu/Natal).

The number of doses of vaccine administered was not studied and if a child had not received the correct number, for age, at the time of the interview, status was determined to be incomplete, i.e. some children may have received 2 doses by the age of 9 months and would for the purposes of this study have been considered to be incompletely immunized.

The study sample comprised 312 children.

Complete coverage was noted in 84 (27%) of the children (children under 3 months of age were counted as "complete" in this study) and incomplete coverage i.e. at least 1 dose of vaccine was noted in a further 102 (33%) of children (TABLE 26, FIGURE 28 & 21).

Thus at least 60% of children had been exposed to 1 dose of trivalent oral Polio vaccine (OPV).

Coverage of 40% of children was unknown (no RTHC) and thus a "worst-case" figure of 40% of children with no polio vaccine exposure was obtained.

Complete coverage for children aged < 2 years was noted to be 37% (TABLE 25, FIGURE 28) compared with 27% complete coverage overall (statistically not significant).

There was a statistically significant association ($p < 0,01$) between the age of children and complete immunisation with children less than 2 years of age showing a significantly increased coverage compared to the older children.

The finding may have demonstrated an encouraging recent trend in the exposure (even if only partial) to OPV, or as was noted above may reflect an increased utilization of RTHCs' as a record, or both.

When one considers that it was estimated that of every 1 000 children born in 1985, 5 would grow up to be crippled by Polio,⁽⁸⁴⁾ one sees the importance of a good Polio immunisation campaign. In the RSA Polio is a notifiable disease, with 71 and 69 cases having been notified in the RSA in 1984 and 1985 respectively.

However, between December 87 and April '88, 275

Polio cases were admitted to hospitals in Natal/KwaZulu, with an estimated incidence during the epidemic of 24,2 per 100 000 in children under 5 yrs.⁽¹⁰¹⁾ Four cases were notified from the Izingolweni district, in which Bomela is situated, during the epidemic but it is not known if any of these were from the Bomela community.

The percentage of complete coverage for Polio, prior to the epidemic, in Bomela was estimated to be 27%, and this state of affairs is unsatisfactory if epidemics are to be prevented - as was subsequently proved by the epidemic. "Herd immunity" of at least 80% is necessary to prevent such epidemics.

Subsequent to the study, during the epidemic, a mass Polio vaccination campaign was undertaken in the Bomela area and the rest of Natal/KwaZulu, using Polio Type I vaccine. However, this campaign has been completed and the problem of ongoing immunisation for this community must be tackled and the situation regarding coverage with all immunisations, improved and maintained. Health workers may need to be permitted and encouraged to go out into their communities to administer vaccines, as it would appear that despite a clinic

service being available within 4 kilometres, it is not being utilized effectively to reach children with vaccinations.

(For a more detailed discussion on Polio immunisation see Literature survey.)

e. DWT/DT immunisation status

The estimated coverage for these vaccines was much the same as for Polio - as one would expect - because the schedule is the same (TABLE 27, FIGURE 22). The slightly greater number of children immunized with DWT compared to OPV may have been due to the common misconception that OPV should not be administered to children suffering from any form of G/E. A Primary Care education programme for the health workers at clinics is ongoing and such issues are being dealt with, (personal). It is discouraging to note that at present there is a shortage of DWT vaccine nationwide (August 1989).

This situation, one hopes, is a temporary phenomenon, but once again highlights the importance of good back-up supply depots of vaccines and good "cold chain" maintenance if vaccination programmes

are to be ongoing and successful. Poor supplies result in dissatisfaction amongst health workers and parents alike and, especially in preventive medicine where healthy children are being "treated", dissatisfaction can do much harm to the effectiveness of such programmes.

(For detailed discussion see Literature Survey.)

f. Place of Immunisation of the children

The results of the study showed that 1131 (89%) of the 1267 vaccines given were administered at a peripheral clinic (TABLE 29, FIGURES 23).

This would suggest that for those children who are being immunized, the clinic is regarded as an important facility for this - and the figure for clinics was higher if one excluded BCG (administered at Birth in hospital).

Thus the clinics are fulfilling their PHC role in this regard up to a point, and this lays the foundation for future increased coverage of the community. The ways in which increased coverage can be attained were discussed earlier and include:-

increased community visitation by the clinic - based health workers, and increasing the acceptance of the clinic by the community as a whole, (the role of the community in planning and managing their health facility could be considered), and a possible role for non-medical community based people to administer vaccines, one feels, should be seriously considered. Vaccines of today are safe and one sees no reason to prevent "non-medical" personnel, operating as part of the "health team" concept, from administering vaccines in the community. The problems which would be encountered such as education and training , supply, "cold-chain" maintenance and monitoring are not insurmountable and indeed one feels the "cost" of dealing with these problems would be small in comparison to the probable long term positive effects of increased coverage.

(For more detailed discussion on immunisation see Literature Survey.)

v. Female Nutrition

The staple diet of the women (and therefore probably the

community as a whole) appeared to be maize, bread and to a lesser extent milk (TABLE 31, FIGURE 25), with 83% of women interviewed eating maize (in some form) on a daily basis, 60% eating bread daily and 50% having milk at least 3-6 times per week. It appeared from the study that just over 20% of mothers ate food which had a relatively low protein content (≤ 2 times/week) i.e. little or no milk and meat.

It is thought, by some, that conception does not take place unless the mother possesses a certain amount ("threshold"?) of energy reserve in the form of fat stores. Also, in a well nourished mother, a transfer of energy to the infant occurs which is thought to "buffer" the infant during the critical weaning period. Maternal malnutrition could thus conceivably lead to poor maternal fat reserves and consequently a low foetal fat reserve.⁽¹⁴¹⁾

This theory is also supported by the above author who recommends that national supplementary feeding programmes for pregnant mothers be considered, in his discussion of priorities for research in maternal nutrition in developing countries.⁽¹⁴²⁾

Programmes aimed at improving the quality of life of women in a community should be seen as a priority and

"Family Planning and Maternal health care re-enforce one another in the fight to reduce maternal mortality, and should go "hand in hand".⁽¹²⁶⁾ Large numbers of women still suffer and die unnecessarily in childbearing and one of the major "indirect" causes of maternal death is malnutrition.⁽¹²⁶⁾

In concluding this brief discussion it is prudent to consider the statement, "wherever low weight birth rates are higher than 10-15% it can be assumed that significant undernutrition among mothers is widespread".⁽¹⁴⁰⁾ Perhaps a drive towards improving maternal nutrition by giving priority towards such a programme over Family Planning programmes would not be unsuccessful in ultimately reducing Fertility rates, as the IMR would decrease in association with increased birth weights and the resulting increase in child survival? One feels personally that feeding schemes are not paternal "handouts" as advocated by some colleagues. Poverty prevents, amongst other things, the women obtaining satisfactory nutrition and poverty cannot be educated away.

(For a more detailed discussion on Female Nutrition see Literature survey.)

vi. Family Spacing

A total of 209 mothers (with children less than six years of age) were included in the study (TABLE 32, FIGURE 26). There were 23 mothers under the age of 20, of whom twenty one (91%) had 1 child and 2 (9%) had 2 children.

The results also indicated that 74% of families had less than 4 children alive and 60% of families had less than 3 children alive. Thus it would appear that although mothers may start families at an early age the majority (74%) of families have less than 4 children alive. This would suggest that either:-

- a. Family Planning methods were being utilized once a mother has had her first child or,
- b. there was a high mortality rate for children (IMR or U5MR).

Most mothers 189 (90%)(of children less than 6 years of age) were aware of the Family Planning methods enquired of in the interview (TABLE 33, FIGURE 27) and 121 (58%) claimed to have used one of the methods. However, 42% intimated that they had never used a method and this would appear to be a relatively high rate of "non-use" - bearing in mind that some of the women using a method

would use it irregularly.

Depo Provera ^(R) (Depo) and combined oral contraceptive pills accounted for 96% of the contraceptive methods used (TABLE 36, FIGURE 28) with Depo having been the most commonly administered, at 70%. If women are able to cope with the menstrual problems associated with progesterone administration then "Depo" is an effective, safe contraceptive. Injecting once every 3 months makes compliance easier and more certain and helps women to avoid being detected by partners who sometimes do not permit them to use a family planning method. Many Black men are not in favour of contraception and one feels that more effort should be spent on educating the males (personal experience).

The clinic, hospital and G.P were used as facilities to obtain family planning advice/service by 68%, 31% and 1% respectively. This was an encouraging aspect, showing that the clinic can be used as the "cornerstone" in a family planning programme and from the clinic, health workers can more easily go into a community (than from either the hospital or G.P).

A discouraging feature was that it is still the minority (47%) of women who are using the family planning service

despite 90% being aware of its existence, and this presents a challenge to health workers and development workers alike. The study did not enquire after reasons for not using the services but a high childhood mortality rate is an obstacle to any family planning programme and this problem must be tackled if family planning is to be accepted. Also men often prohibit contraceptives as mentioned above. Non-physicians including community members themselves can provide most contraceptives safely and effectively⁽¹²⁹⁾ - yet personal experience brings to mind a family planning clinic based in the grounds of a hospital where adolescents and unmarried sexually active teenagers are expected to attend under the scrutiny of hospital staff and patients! Perhaps it is time that family planning services were removed from the total domain of health services and placed more into the hands of trusted Community members? The location of services, opening times and degree of privacy afforded to clients are important factors to consider when establishing a Family Planning Programme.

Studies, carried out to estimate the independent effect of family planning programmes on the fertility of the developing world, calculated that only 5% of the variation in CBR decline for 89 developing countries was due directly to family planning programmes.⁽¹²⁴⁾

Does one dare to suggest that the allocation of resources to the various components of the Population Development Programme (PDP) of the RSA be analyzed and re-allocated appropriately where necessary - in order to achieve the "ideal" of a stable population/family size? The researcher has heard a few people suggest that the word Population (in PDP) suggests the idea of population control (political) as being the prime motivation behind the PDP, whereas community development may be a more acceptable term.

Family Planning is still however an important tool in improving maternal and child health because in poor communities it has been estimated that the IMR for babies born within 1 year of a previous birth is usually between 2-4 times greater than for babies born after an interval of 2 years or more.⁽¹²⁵⁾

Twenty two mothers (10%) had a child while still under the age of twenty years - this is unsatisfactory and education in this area needs to be studied and given the priority it deserves.

(For a more detailed discussion on Family Planning (spacing) see Literature survey.)

vii. Female Education

The results of this study showed that 465 (80%) females, aged 16 years or more had not achieved Std.8 level of education (assessed by the local school principal as the level required to be able to read and understand a daily newspaper) (TABLE 4). It was also noted that 32 females (14%) between the ages of 6-16 years were not attending school at the time of study.

Thus although 97% of females had commenced school, sadly, it appeared that the majority were leaving school before Std.8 was attained. This is not satisfactory. [A limitation of the study (due to questionnaire design) was that the exact number of males and females who - for age - should have reached Std.8 was not determinable].

It was interesting to note that there was no statistically significant difference between males and females in the level of education achieved.

Basic education is given as one of the priorities in a recent UNICEF report for action to meet "basic human needs in difficult times ...",⁽¹³⁵⁾ along with the need to

recognize the key role that women play in most societies. One of the important components of the PDP in the RSA is that of education,⁽¹²³⁾ and in the same article it is stated, "... being aware of the fact that 42% of our population is less than 15 years old, education is arguably the most important factor".

It has been stated that the "education of girls is one of the best health investments which a developing country can make",⁽¹³⁶⁾ making education one of the most important aspects of a GOBI-FFF programme. The figure of 14% of girls (6-16 yrs) not attending school in Bomela was unsatisfactory and this problem should be addressed. In the light of this, one would recommend - based on the results of this study, that, in Bomela, the reasons that such a large percentage girls were not completing at least Std.8 education should be ascertained and a way of changing this situation should be planned and implemented as a matter of priority. It is interesting to note that one study estimated that "each one-year increment in a mother's education corresponds with a 7-9% decline in under-5's mortality".⁽¹³⁷⁾

It is encouraging to note that in the area there would appear to be no statistically significant difference between males and females in school attendance figures

and that the vast majority of children are commencing school. In many developing countries males far outnumber females in school attendance due to socio-cultural factors. This at least is laying the foundation for potential improvement in the final educational standard achieved by all, and should encourage all concerned to continue with the expansion and improvement of educational facilities amongst the under-privileged. It was disappointing to note that this year (1989) there appears to have been a cutback in the education expansion programme for Blacks - apparently due to shortage of funds. Once again Apartheid policy and the subsequent sanctions applied are affecting community development.

(For a more detailed discussion on education see Literature survey.)

H. UTILIZATION OF HEALTH SERVICE FACILITIES

i. Place of birth (of youngest child <6 years old)

There were 204 children about whom information was obtained in this sample and of these, 94 (46%), 77(38%) and 33(16%) delivered at hospital, home and a clinic

respectively. There was no statistically significant association between place of delivery and educational status of the mothers (TABLE 38, FIGURE 30).

There is still a high percentage (38%) of babies being delivered at home. This study does not take account of the number of women who attended an ante-natal clinic and subsequently delivered at home, and did not determine the reasons for home delivery. Amongst the Zulus, aunts and mothers or grandmothers of pregnant women often play an important role in delivering babies and in dealing with a sensitive issue such as this it was difficult to determine the true picture in the community with regards to the role of Traditional Birth Attendants (TBA's). The role of TBA's and home deliveries must be acknowledged and accepted as inevitable by all. The incorporation of TBA's into national and local PHC programmes is difficult but ways and means of gaining co-operation with this important group of people should be sought and encouraged. Good practices (and harmless ones) can be encouraged and bad or dangerous practices can be discouraged using appropriate health education.

The question as to "why do so many still deliver at home?" is still an interesting one and the answer lies somewhere in the great debate about utilization of health

facilities i.e. accessibility, acceptability, affordability and alternatives present, cultural practices and education/knowledge.

ii. Time taken to reach Bomela clinic

Two Hundred households were sampled and 79(40%), 40(20%) and 81(40%), estimated that it would take $<\frac{1}{2}$ Hr, $\frac{1}{2}$ Hr - 1 Hr and >1 Hr respectively to reach the clinic (TABLE 39, FIGURE 31). No household interviewed was more than 4 kilometres from the clinic (well within that recommended by WHO in "HFA 2000").⁽²⁾

Thus physical accessibility to Bomela clinic for this community is in theory not a problem, except perhaps for the "hill terrain", if guidelines for PHC as given by WHO are accepted. The Bomela community would thus appear to have a well-sited clinic.

iii. Health Facility of choice for a sick child

a. Minor illness

The majority [167 (83%)] of households would have elected to take a child to the clinic and 15% would have sought the advice of a traditional healer first

- this figure was presumably an "under-count" as the issue is a sensitive one in developing communities. The fact is that traditional healers are present and active and one cannot "will away" their existence (TABLE 40, FIGURE 32). Their co-operation, and advice, in some instances, should be valued and sought and more efforts should be made for links to be forged between traditional and "Western" medicine. One accepts that this is a long and usually difficult process but the long term effects may well be positive for the community as a whole. Their advice in minor ailments was preferred to that of GP's in this community.

b. Severe illness (as judged by mother)

It was interesting that an increased number (27% - up from 2% for minor illnesses) would have elected to bring their children direct to hospital for a severe illness. Does this imply that the clinic was still not accepted as a "good" facility for very sick children? - a further 19% elected to attend a G.P directly (TABLE 40, FIGURE 32). The importance of an adequate supporting/referral hospital is emphasized if peripheral clinics (PHC) are to function effectively.

The G.P. formed an important link in this "chain" of health care delivery - even in poor communities such as Bomela - and their role is invaluable. Personal experience has shown one that often it is not the cost of a service which determines the use thereof - many factors influence the choice.

iv. Transport to Health Facility of choice (Minor illness)

209 Mothers were interviewed on this question. 126 (60%) walked to their health service facility of choice (minor illness) and taxi and buses shared roughly equal proportions for the rest (TABLE 42, FIGURE 33).

This again would seem to emphasize the importance of physical accessibility of health facilities to communities and one should always take this into account when planning the siting of any facility. Yet as was seen above, despite being within 4 kilometres of the clinic a considerable number of people did not use the clinic - why? The study did not attempt to answer this question.

Access to facilities by "all-weather" roads is an important factor and health facilities should not be

built before the access roads, which are so important in PHC, (both for access to the community and to referral and supply centres) are in existence. The maintenance of these roads is another important issue and should not be overlooked if utilization of a facility is to be optimised - a factor which was noted at a symposium organized to determine priorities in Health care in the Izingolweni area in 1988 (personal). A community member pointed out the importance of good roads leading to a clinic during the symposium organized by the Medical Superintendent of Murchison Hospital (the referral hospital). At many clinics the access roads do not permit ambulances to gain entry during wet weather. This is unacceptable to the effective delivery of PHC to rural communities.

However, physical accessibility is not the only problem preventing utilization of a facility and all the other social and economic and cultural factors play a role in a complex situation which cannot simply be overlooked by health planners and workers. One personally feels that real community participation in the planning of any service should be a priority before the service is introduced to that community. The role of the clinic committee should be strengthened in this respect - but this is not an easy concept to implement and maintain.

CONCLUSION

"Health for all by 2000" will not be attained in the Bomela community if the current cycle of poverty and disease is not broken by considerably increasing the real income of the poor in the community. One believes that one of the major causes of inequality (in political, educational, sexual and health spheres) is the economic reality which prevails in our society in general - including Bomela. Abolish inequality and one may then move towards a society which can implement PHC programmes. Apartheid (and the resulting sanctions directed at this policy) is not helping to abolish this inequality which exists in Bomela and many other local rural communities in the RSA.

Increased commitment by Politicians, Health Managers (NPA and KwaZulu), Health Workers and communities, to PHC (as envisaged at Alma-Ata) is essential if we are to attain Health for even 60% of our population by 2000. Without commitment and the appropriate allocation of the essential resources, the present profile of the "developing community of Bomela" will remain unchanged by the year 2000.

When one considers that Disease in developing communities is related to water, sanitation, housing, education, nutrition, sex differences and access to health facilities (source: WORLD BANK -

Health: Sector policy paper, 1980), then this study has attempted to present the "relationship to disease" situation which exists in the Bomela community.

The governments of the RSA and KwaZulu profess to be committed to achieving a more healthy population through the policy contained in the National Health Services Facilities Plan. Serious and active efforts must be made in health planning in the context of total socio-economic development, including health infrastructure development. But to desire a goal e.g. "HFA by 2000", to be committed to a goal or even to work steadily and diligently toward that goal is not always enough - all resources must be mobilised efficiently and effectively and all obstacles removed if the ultimate goal is to be achieved. Despite all our concerted efforts, success in the final analysis will depend on our ability to identify, acquire and mobilise the necessary resources including, (very importantly) - finances, manpower, materials and health managers and communities motivated and committed to the "concepts" of PHC. It is also essential to remove such obstacles as Apartheid, sanctions and obstructive "petty" local traditions and rivalries which may exist.

The road will remain rough and the going difficult - but then that offers all health workers and any person concerned with community upliftment the challenge. For often when there is no challenge it is difficult to motivate the human species.

RECOMMENDATIONS

1. The governments (RSA and KwaZulu) should increase their commitment to PHC (as envisaged at ALMA-ATA) within their national development programmes (e.g. PDP) with special reference to rural and peri-urban areas of the country - including Bomela by implementing stage 1 of the National Health Services Facilities Plan (NHSFP). This will mean increased co-operation between all those sectors responsible for delivering any service related to PHC i.e. water, sewerage, housing, health care and employment and education. I believe this cooperation already exists in the Murchison Hospital catchment area (including Bomela) and should be encouraged and expanded. However, to implement stage I of the NHSFP will require re-allocation of funds from existing programmes. This is a challenge to planners - and a responsibility.

2. Increased community participation e.g. through clinic committees would seem to be important to decrease home deliveries and home deaths of children and to increase vaccination coverage and toilet building and usage. If projects are not acceptable to a community they will not function efficiently and effectively and facilities will subsequently not be optimally utilised. Ways of increasing community involvement / participation must be sought and

implemented. The issue of community participation provokes enormous debate - but no one can deny that at present very little initial planning / participation takes place at the community level.

3. Continued expansion and improvement of education facilities for Blacks is a priority. Female education is vital for decreasing childhood mortality and improving overall health status in a community and education of males is important with respect to employment. Female literacy programmes for the women who have left school would be invaluable. Caution in the approach to education is however, essential. It should be acceptable and appropriate to the community.
4. PHC should focus on the main health problems in a community and for Bomela one would suggest promotion of health education with respect to measles, pneumonia and gastro-enteritis, and the related problems of water supply, sanitation and hygiene and immunisations.

An adequate supply of safe water and basic sanitation is essential and "protected" springs and "toilet building" programmes should be given priority. If boreholes are to be placed in the community, the machinery/equipment must be reliable and maintenance free with a guarantee given by the contractor to repair/replace an faulty equipment. Poor

communities cannot afford sub-standard pumps etc. One believes that, at present, increased emphasis should be placed on "protecting" the springs which yield water all year round (many dry up during the winter months) and which are already used by the community i.e. use existing resources.

5. Immunisation administration (except BCG) would appear to be not attaining acceptable coverage of the children or alternately, the recording system is not satisfactory, i.e. RTHC. Both these issues need to be tackled as a priority. One suggestion would be to immunise children as they attend clinic and not simply on a particular "immunisation" day. This may well be cost-effective in the long term and more acceptable/accessible to the community.
6. The creation of employment is difficult when sanctions is being applied so ruthlessly, but a way of counteracting this is for urgent Political reform (i.e. abolishing Apartheid), to continue so that people have equal opportunities in every sphere of life. Only by creating equal and adequate employment opportunities will the cycle of poverty - disease - lethargy and more poverty be broken. A good standard of education coupled with employment will also result in a decline of the population growth.
7. Clinic staff and health workers in hospitals must develop

close relationships with the community of people in their "catchment areas". This will mean increased penetration into the community by health workers in the clinic and genuine community participation in decision-making regarding all matters affecting health. Increased co-operation between health workers (clinic and hospital) and traditional healers and TBAs would be advisable - but admittedly this has proved difficult in practice. If clinic staff visited the community in their homes, increased acceptance by all could well be achieved. However, education of health personnel on appropriate "visitation technique" is essential.

8. The role of the RTHC and its correct use needs to be evaluated. One acknowledges that RTHC (growth monitoring and immunisation record) is the most difficult aspect of GOBI-FFF to perform and evaluate, nevertheless, if it is to continue to be used it should be used correctly. If not, then it should be discarded in favour of an alternative more effective "record tool". The initial step one recommends would be to introduce one uniform design only for the RSA (including "Homelands"), accompanied by the education of Primary care workers as to their value and correct usage.
9. The reasons for apparent under-utilisation of the Bomela clinic, by a community all within seemingly acceptable physical access, according to WHO standards should be

determined and the results used to improve utilisation, e.g. why do over 50% of babies still die at home and over 30% of deliveries still occur at home? These questions need answers and subsequent appropriate action to be taken.

10. The health authorities responsible for health care delivery in the area (NPA and KwaZulu) should continue to support PHC as a concept and should increase their commitment to implement PHC (in all areas) - the researcher personally favours comprehensive PHC (as envisaged at Alma-Ata) at the same time acknowledging the important role GOBI-FFF has to play in the community.
11. Continued support by the Murchison Hospital health team to peripheral health workers is essential and should be encouraged. Unless a motivated, good quality referral centre is present, peripheral clinics involved in PHC cannot function optimally and anxiety for these workers with the risk of resignations will remain a major problem.
12. The Department of Health Services, NPA should continue to extend beyond the hospital boundaries to co-operate at all levels in the periphery with existing health structures and to offer more of its resources to those in the poor peri-urban and rural areas. More incentives to staff may have to be considered for those working "in the periphery".

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TABLE 1

AGE AND SEX DISTRIBUTION OF THE BOMELA COMMUNITY

NUMBER AND PERCENT (%)

AGE	SEX		TOTAL
	MALE	FEMALE	
< 1 YEAR	33 (5)	34 (4)	67 (4)
1-4 YRS	92 (12)	98 (10)	190 (11)
5-15 YRS	216 (29)	224 (24)	440 (26)
16-44 YRS	309 (41)	431 (46)	740 (44)
45-64 YRS	80 (11)	113 (12)	193 (11)
> 64 YRS	18 (2)	34 (4)	52 (3)
TOTAL	748 (100)	934 (100)	1682 (100)

TABLE 2

ASSOCIATION BETWEEN ECONOMIC ACTIVITY AND SEX

NUMBER AND PERCENT (%)

ECONOMIC ACTIVITY	SEX		TOTAL
	MALE	FEMALE	
LESS THAN 6 YEARS	152 (20)	160 (17)	312 (19)
6-16 YRS AT SCHOOL	182 (24)	200 (21)	382 (23)
6-16 YRS NOT AT SCHOOL	38 (5)	32 (3)	70 (4)
> 16 YRS EMPLOYED	230 (31)	188 (20)	418 (25)
> 16 YRS UNEMPLOYED	98 (13)	260 (28)	358 (21)
OLD AGE PENSIONER	21 (3)	76 (8)	97 (6)
SINGLE CARE GRANT	10 (1)	8 (1)	18 (1)
DISABILITY GRANT	12 (1)	5 (<1)	17 (1)
OTHER*	4 (<1)	6 (1)	10 (<1)
TOTAL	747 (100)	935 (100)	1682 (100)

*OTHER denotes those persons about whom information was missing or incorrect on the questionnaires.

TABLE 3ASSOCIATION BETWEEN ECONOMIC ACTIVITY AND EDUCATIONNUMBER AND PERCENT (%)

ECONOMIC ACTIVITY	EDUCATIONAL LEVEL ACHIEVED						TOTAL
	NIL	<STD 5	STD 5-7	STD 8-9	MATRIC	OTHER	
< 6 YRS OF AGE	310(62)	2(<1)	0(0)	0(0)	0(0)	0(0)	312(19)
6-16 YRS AT SCHOOL	10(2)	258(37)	82(30)	30(16)	1(6)	0(0)	381(23)
6-16 YRS NOT AT SCHOOL	20(4)	34(5)	10(4)	7(4)	0(0)	0(0)	71(4)
>16 YRS EMPLOYED	36(7)	198(28)	96(35)	96(35)	12(71)	0(0)	418(25)
>16 YRS UNEMPLOYED	62(12)	166(24)	76(28)	52(27)	2(12)	0(0)	358(21)
OLD AGE PENSIONER	44(9)	45(6)	8(3)	0(0)	0(0)	0(0)	97(6)
SINGLE CARE GRANT	12(2)	4(<1)	2(1)	0(0)	0(0)	0(0)	18(1)
DISABILITY GRANT	9(2)	8(1)	0(0)	0(0)	0(0)	0(0)	17(1)
OTHER	0(0)	0(0)	0(0)	6(3)	2(12)	2(100)	10(<1)
TOTAL	503(100)	695(100)	274(100)	191(100)	17(100)	2(100)	1682(100)

TABLE 4
ASSOCIATION BETWEEN EDUCATION AND SEX
NUMBER AND PERCENT (%)

EDUCATION	SEX		TOTAL
	MALE	FEMALE	
NIL	212 (29)	288 (30)	500 (30)
< STD 5	313 (44)	384 (40)	697 (41)
STD 5-7	96 (13)	178 (18)	274 (16)
STD 8-9	92 (13)	97 (10)	189 (11)
MATRIC	6 (1)	14 (1)	20 (1)
OTHER	0 (0)	2 (<1)	2 (<1)
TOTAL	719 (100)	963 (100)	1682 (100)

- * Out of 985 people in sample who are > 16 years of age, (Table 3), only 212 have complete >= STD 8 education, i.e. 21,5%.
- * Fourteen percent of those aged 6 years and over had received no formal education.

TABLE 5

CROWDING INDEX

AVERAGE NUMBER OF ROOMS FOR SLEEPING	NUMBER OF PEOPLE IN SAMPLE	NUMBER OF PEOPLE PER HOUSEHOLD	RESIDENTS SLEEPING PER ROOM
2,8	1682	8,4	3

The average number of residents sleeping per room is 3 (8,4 / 2,8)

TABLE 6

HOUSEHOLD SANITATION

NUMBER AND PERCENT (%)

TOILET TYPE	NUMBER
NIL	76 (38%)
PIT	123 (61,5%)
OTHER*	1 (0,5%)

* One household used a bucket-system.

TABLE 7

ASSOCIATION BETWEEN EDUCATION OF HEAD OF HOUSEHOLD AND SANITATION

NUMBER AND PERCENT (%)

EDUCATION	SANITATION (TOILET)			TOTAL
	NIL	PIT	OTHER	
NIL	39 (51)	22 (18)	0 (0)	61 (31)
< STD 5	26 (34)	48 (39)	0 (0)	74 (37)
STD 5-7	8 (11)	40 (33)	1 (100)	49 (25)
STD 8-9	3 (4)	13 (11)	0 (0)	16 (8)
MATRIC	0 (0)	0 (0)	0 (0)	0 (0)
TOTAL	76 (100)	123 (100)	1 (100)	200 (100)

TABLE 8

AVAILABILITY OF LARTINES AND REFUSE DISPOSAL FACILITY

NUMBER AND PERCENT (%)

NO FACILITY	LATRINE AND REFUSE DISPOSAL	LATRINE ONLY	REFUSE DISPOSAL ONLY
14 (7)	57 (29)	67 (34)	62 (31)

TABLE 9

MAIN SOURCE OF WATER USED

NUMBER AND PERCENT (%)

SOURCE OF WATER SUPPLY	NUMBER
SPRING	127 (64)
STREAM	54 (27)
BOREHOLE	16 (8)
TANK	3 (2)
TOTAL	200 (100)

TABLE 10

DISTANCE TO WATER SOURCE

NUMBER AND PERCENT (%)

DISTANCE	NUMBER
INDOOR	1 (<1)
< 200 METRES	40 (20)
200-500 METRES	83 (42)
> 500 METRES	76 (38)
TOTAL	200 (100)

TABLE 11
TYPE OF GARDEN AT HOUSEHOLD
NUMBER AND PERCENT (%)

TYPE OF GARDEN	NUMBER
NIL	71 (36)
OWN	106 (53)
COMMUNAL	23 (12)
TOTAL	200 (100)

TABLE 12

ASSOCIATION BETWEEN EPISODES OF MORBIDITY IN PREVIOUS 6 MONTHS AND AGE
NUMBER AND PERCENT (%)

MORBIDITY	AGE (COMPLETED YEARS)					TOTAL
	1	2	3	4	5	
MEASLES	6(14)	8(17)	5(11)	2(6)	2(4)	23(11)
G/E	9(21)	10(22)	4(9)	3(10)	2(4)	28(13)
PNEUMONIA	15(35)	4(9)	20(44)	6(19)	9(18)	54(25)
WHOOPING COUGH	8(19)	8(18)	4(9)	2(6)	2(4)	24(11)*
T.B.	2(5)	0(0)	0(0)	4(12)	4(8)	10(5)
POLIO	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
OTHER	3(7)	16(36)	12(27)	14(45)	30(61)	75(35)
TOTAL	43(100)	46(100)	45(100)	31(100)	49(100)	213(100)

* Whooping cough incidence is high - ? error in diagnosing from history as it may be confused with viral pneumonia, parapertussis, asthma and pneumonia.

TABLE 13

ASSOCIATION BETWEEN CAUSE OF DEATH (< 6 YRS) AND AGE AT DEATH

NUMBER AND PERCENT (%)

CAUSE OF DEATH	AGE						TOTAL
	< 1	< 2	< 3	< 4	< 5	< 6	
MEASLES	14(23)	4(25)	2(11)	0(0)	0(0)	0(0)	20(21)
G/E	23(38)	2(13)	2(11)	0(0)	0(0)	0(0)	27(28)
PNEUMONIA	15(25)	4(25)	10(56)	0(0)	0(0)	0(0)	29(30)
WHOOPING COUGH	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
T.B.	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
POLIO	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
OTHER	9(15)	6(37)	4(22)	0(0)	2(100)	0(0)	21(22)
TOTAL	61(100)	16(100)	18(100)	0(100)	2(100)	0(100)	97(100)

TABLE 14

ASSOCIATION BETWEEN PLACE OF DEATH AND AGE OF DEATHS (< 6 YEARS)

NUMBER AND PERCENT (%)

PLACE OF DEATH	AGE AT DEATH						TOTAL
	< 1	< 2	< 3	< 4	< 5	< 6	
HOME	36(59)	5(32)	7(40)	0(0)	0(0)	0(0)	48(49)
HOSPITAL	25(41)	11(68)	11(60)	0(0)	2(100)	0(0)	49(51)
OTHER	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
TOTAL	61(100)	16(100)	28(100)	0(0)	2(100)	0(0)	97(100)

TABLE 15

ASSOCIATION BETWEEN AGE OF CHILD AND PRESENCE OF GROWTH CHART

NUMBER AND PERCENT (%)

AGE (COMPLETED YEARS)	PRESENCE OF GROWTH CHART		TOTAL
	YES	NO	
< 2	118 (56)	7 (7)	125 (40)
2	35 (17)	13 (13)	48 (15)
3	30 (14)	13 (13)	43 (14)
4	12 (6)	29 (28)	41 (13)
5	14 (7)	41 (40)	55 (18)
TOTAL	209 (100) (70)	103 (100) (30)	312 (100)

* PRESENCE OF RTHC FOR 70% OF CHILDREN

* PRESENCE OF RTHC FOR 85% OF CHILDREN OF 3 YEARS AND UNDER.

TABLE 16

IS THE GROWTH CHART (RTHC) UP TO DATE?

NUMBER AND PERCENT (%)

UP TO DATE	NUMBER
YES	88 (42)
NO	121 (58)
TOTAL	196 (100)

*NOTE: RTHC UP TO DATE IN 28% OF ALL THE CHILDREN < 6 YEARS OF AGE.

TABLE 17

NUMBER OF HOUSEHOLDS WHO HAVE HEARD OF O.R.T.

NUMBER AND PERCENT (%)

HEARD OF O.R.T.	NUMBER
YES	121 (61)
NO	79 (40)
TOTAL	200 (100)

TABLE 18

DOES THE CHILD MINDER KNOW HOW TO MAKE O.R.T?
(of those who have heard of O.R.T)

NUMBER AND PERCENT (%)

MAKE O.R.T.	NUMBER
YES	74 (61)*
NO	47 (39)
TOTAL	121 (100)

* 74 HOUSEHOLDS IS 37% OF THE TOTAL HOUSEHOLDS SURVEYED

TABLE 19

USE OF O.R.T BY THOSE WHO KNOW HOW TO MAKE IT

NUMBER AND PERCENT (%)

USE OF O.R.T.	NUMBER
YES	19 (26)*
NO	55 (75)
TOTAL	74 (100)

* 10% OF ALL HOUSEHOLDS HAVE USED O.R.T AS INSTRUCTED BY THE CLINICS OR HOSPITALS

TABLE 20
HOSPITALISATION AFTER USE OF ORT
NUMBER AND PERCENT (%)

HOSPITALISED	NUMBER
YES	5 (26)
NO	14 (74)
TOTAL	19 (100)

TABLE 21

ASSOCIATION BETWEEN EDUCATION OF MOTHER AND KNOWLEDGE OF MAKING O.R.S.

NUMBER AND PERCENT (%)

EDUCATION LEVEL	KNOWLEDGE		TOTAL
	YES	NO	
NIL	2 (4)	16 (11)	18 (9)
< STD 3	21 (38)	80 (53)	101 (49)
STD 3 - 7	22 (38)	38 (25)	60 (29)
STD 8 +	10 (20)	18 (12)	28 (14)
TOTAL	55 (100)	152 (100)	207 (100)

TABLE 22

REASON FOR STOPPING BREAST FEEDING IN RELATION TO DURATION OF BREAST FEEDS

NUMBER AND PERCENT (%)

REASONS FOR STOPPING	DURATION OF B/FEEDS (MONTHS)					TOTAL
	< 1	1-3	4-6	7-9	> 9	
NO MILK	7(47)	2(4)	6(11)	0(0)	0(0)	15(4)
NOT ENOUGH MILK	2(13)	30(61)	18(33)	4(12)	2(1)	56(16)
MOTHER WORKING	2(13)	11(22)	22(41)	16(48)	8(4)	59(17)
POWDERED MILK PREFERED	0(0)	2(4)	0(0)	0(0)	0(0)	2(<1)
WEANING	0(0)	4(8)	2(4)	4(12)	167(88)	177(52)
OTHER	4(26)	0(0)	6(11)	10(29)	12(6)	32(9)
TOTAL	15(100)	49(100)	54(100)	34(100)	189(100)	341(100)

TABLE 23

OVERALL STATUS OF IMMUNISATION

(EXCLUDES BCG IMMUNISATION STATUS)

NUMBER AND PERCENT (%)

IMMUNISATION STATUS			TOTAL
COMPLETE	INCOMPLETE	UNKNOWN	
84 (27)	102 (33)	126 (40)	312 (100)

TABLE 24

BCG IMMUNISATION STATUS
(BASED ON PRESENCE OF SCAR)

NUMBER AND PERCENT (%)

AGE (YEARS)	BCG STATUS		TOTAL
	YES	NO	
< 2	58 (23)	8 (13)	66 (21)
2	53 (21)	10 (16)	63 (20)
3	53 (21)	14 (23)	67 (21)
4	30 (12)	11 (17)	41 (13)
5	56 (22)	19 (31)	75 (24)
TOTAL	250 (100)	62 (100)	312 (100)

TABLE 25

MEASLES IMMUNISATION STATUS
(BASED ON PRESENCE OF R.T.H.C.)

NUMBER AND PERCENT (%)

AGE (COMPLETED YEARS)	STATUS OF IMMUNISATION			TOTAL
	YES	NO	UNKNOWN	
< 1	16 (18)	47 (48)	4 (3)	67 (21)
1	29 (33)	17 (17)	18 (14)	64 (21)
2	27 (31)	20 (20)	21 (17)	68 (22)
3	9 (10)	3 (3)	30 (24)	42 (13)
4 +	7 (8)	11 (12)	53 (42)	71 (23)
TOTAL	88 (100)	98 (100)	126 (100)	312 (100)

NOTE: RTHC'S AND CLINIC CARDS WERE ACCEPTED FOR RECORD PURPOSES

TABLE 26
POLIO IMMUNISATION STATUS
NUMBER AND PERCENT (%)

AGE (YEARS)	STATUS OF IMMUNISATION			TOTAL
	COMPLETE	INCOMPLETE	UNKNOWN	
< 1	29 (35)	34 (33)	4 (3)	67 (21)
1	19 (23)	26 (26)	19 (15)	64 (21)
2	25 (29)	22 (21)	21 (17)	68 (22)
3	1 (1)	11 (11)	30 (24)	42 (13)
4+	10 (12)	9 (9)	52 (41)	71 (23)
TOTAL	84 (100)	102 (100)	126 (100)	312 (100)

NOTE: Since the survey was performed a polio epidemic was experienced in Natal/KwaZulu which led to a mass immunisation campaign with vaccine (Polio Type I). These figures would thus not represent present status.

TABLE 27

DWT/DT IMMUNISATION STATUS

NUMBER AND PERCENT (%)

AGE (YEARS)	STATUS OF IMMUNISATION			TOTAL
	COMPLETE	INCOMPLETE	UNKNOWN	
< 1	30 (34)	33 (34)	4 (3)	67 (21)
1	21 (24)	24 (25)	19 (15)	64 (21)
2	25 (28)	22 (22)	21 (17)	68 (22)
3	3 (3)	9 (9)	30 (24)	42 (13)
4+	10 (11)	9 (9)	52 (41)	71 (23)
TOTAL	89 (100)	97 (100)	126 (100)	312 (100)

TABLE 28

IS IMMUNISATION THOUGHT TO BE IMPORTANT TO THE MOTHER/CHILD MINDER?

NUMBER AND PERCENT (%)

IMMUNISATION IMPORTANT	NUMBER
YES	156 (78)
NO	44 (22)
TOTAL	200 (100)

TABLE 29

PLACE WHERE VACCINE WAS ADMINISTERED

NUMBER AND PERCENT (%)

PLACE	VACCINE				TOTAL
	BCG	MEASLES	DT	POLIO	
CLINIC	146 (58)	83 (94)	459 (97)	443 (97)	1131 (89)
HOSPITAL	104 (42)	3 (4)	9 (2)	9 (2)	125 (10)
MOBILE	0 (0)	2 (2)	5 (1)	4 (1)	11 (1)
OTHER	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
TOTAL	250 (100)	88 (100)	473 (100)	456 (100)	1267 (100)

THE GREATER NUMBER OF BCG VACCINES ADMINISTERED AT THE CLINIC COMPARED TO HOSPITAL WOULD SUGGEST THAT BABIES BORN AT HOME ARE BEING BROUGHT TO THE CLINIC FOR THEIR BCG VACCINATION.

TABLE 30

ASSOCIATION BETWEEN MATERNAL EDUCATION AND IMMUNISATION STATUS

NUMBER AND PERCENT (%)

EDUCATION	STATUS OF IMMUNISATION			TOTAL
	COMPLETE	INCOMPLETE	UNKNOWN	
NIL	1 (3)	8 (15)	9 (8)	18 (9)
< STD 3	20 (47)	29 (55)	53 (47)	102 (49)
< STD 8	10 (24)	16 (30)	35 (34)	61 (29)
STD 8 +	11 (27)	0 (0)	17 (11)	28 (13)
TOTAL	42 (100)	53 (100)	114 (100)	209 (100)

* STATUS OF IMMUNISATION IN THIS TABLE REFERS TO STATUS OF ALL CHILDREN IN A FAMILY

TABLE 31

DIET OF MOTHERS IN PREGNANCY

NUMBER AND PERCENT (%)

NUTRITION	FREQUENCY				TOTAL
	DAILY	3-6 X/WK	1-2 X/WK	< 1/WK	
MAIZE	66 (83)	8 (10)	2 (3)	3 (4)	79 (100)
MEAT/FISH	7 (9)	19 (24)	40 (51)	13 (16)	79 (100)
MILK	15 (19)	34 (43)	22 (28)	8 (10)	79 (100)
FRUIT	16 (20)	13 (16)	26 (33)	24 (30)	79 (100)
BREAD	47 (59)	23 (29)	7 (9)	2 (3)	79 (100)
VEGETABLES	14 (18)	19 (24)	26 (33)	20 (25)	79 (100)

TABLE 32

FAMILY SIZE ACCORDING TO MATERNAL AGE

NUMBER AND PERCENT (%)

AGE	NO. OF CHILDREN (ALIVE)									TOTAL
	1	2	3	4	5	6	7	8	> 8	
< 20 YRS	21(29)	2(4)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	23(11)
20-30	34(47)	29(57)	16(52)	5(19)	2(15)	0(0)	0(0)	0(0)	0(0)	86(41)
31-40	10(14)	13(26)	8(26)	13(48)	8(62)	8(100)	2(66)	0(0)	0(0)	62(30)
> 40	8(11)	7(14)	7(22)	9(33)	3(23)	0(0)	1(33)	3(100)	0(0)	38(18)
TOTAL	73(100)	51(100)	31(100)	27(100)	13(100)	8(100)	3(100)	3(100)	0(0)	209(100)

TABLE 33

MOTHERS' AWARENESS OF FAMILY PLANNING

NUMBER AND PERCENT (%)

HEARD OF FAMILY PLANNING	NUMBER
YES	189 (90)
NO	20 (10)
TOTAL	209 (100)

TABLE 34

MOTHERS' USE OF FAMILY PLANNING

NUMBER AND PERCENT (%)

FAMILY PLANNING USED	NUMBER
YES	121 (58)
NO	88 (42)
TOTAL	209 (100)

TABLE 35

USE OF FAMILY PLANNING BY WOMEN

(BETWEEN AGES 16-44)

NUMBER AND PERCENT (%)

WOMEN USING FAMILY PLANNING	NUMBER
YES	203 (47)
NO	228 (53)
TOTAL	431 (100)

TABLE 36
METHOD OF FAMILY PLANNING USED
NUMBER AND PERCENT (%)

METHOD	NUMBER
DEPO PROVERA	140 (69)
ORAL CONTRACEPT.	55 (27)
I.U.C.D.	5 (3)
OTHER	3 (1)
TOTAL	203 (100)

TABLE 37

PLACE WHERE FAMILY PLANNING SERVICE WAS OBTAINED

NUMBER AND PERCENT (%)

PLACE	NUMBER
CLINIC	138 (68)
HOSPITAL	63 (31)
G.P.	2 (1)
TOTAL	203 (100)

TABLE 38

ASSOCIATION BETWEEN MATERNAL EDUCATION AND PLACE OF BIRTH OF YOUNGEST CHILD

NUMBER AND PERCENT (%)

PLACE OF BIRTH	EDUCATION				TOTAL
	NIL	< STD 3	STD 3-7	STD 8 +	
HOME*	6 (33)	47 (46)	22 (36)	2 (9)	77 (38)
CLINIC	2 (11)	17 (17)	6 (10)	8 (35)	33 (16)
HOSPITAL	10 (56)	38 (37)	33 (54)	13 (57)	94 (46)
OTHER	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
TOTAL	18 (100)	102 (100)	61 (100)	23 (100)	204 (100)

TABLE 39

TIME TAKEN TO REACH BOMELA CLINIC

NUMBER AND PERCENT (%)

TIME	NUMBER
< 1/2 HR	79 (39,5)
1/2 HR - 1 HR	40 (20,0)
> 1 HR	81 (40,5)
TOTAL	200 (100)

TABLE 40**HEALTH FACILITY OF CHOICE FOR A SICK CHILD****NUMBER AND PERCENT (%)**

FACILITY	SEVERITY OF ILLNESS (JUDGED BY MOTHER)	
	SEVERE	MINOR
CLINIC	111 (53)	167 (80)
HOSPITAL	56 (27)	3 (2)
TRADITIONAL HEALER	3 (1)	31 (15)
G.P.	39 (19)	6 (3)
OTHER	0 (0)	2 (1)
TOTAL	209 (100)	209 (100)

TABLE 41

TIME TAKEN TO REACH HEALTH FACILITY OF CHOICE

NUMBER AND PERCENT (%)

TIME	SEVERITY OF ILLNESS		TOTAL
	SEVERE	MINOR	
< 1/2 HR	42 (21)	84 (42)	126 (31)
> 1/2 HR	158 (79)	116 (58)	274 (69)
TOTAL	200 (100)	200 (100)	400 (100)

TABLE 42

TRANSPORT TO HEALTH FACILITY OF CHOICE (MINOR ILLNESS)

NUMBER AND PERCENT (%)

HEALTH FACILITY	TRANSPORT				TOTAL
	WALK	CAR	TAXI	BUS	
CLINIC	98 (78)	2 (100)	38 (81)	29 (85)	167 (80)
HOSPITAL	0 (0)	0 (0)	0 (0)	3 (9)	3 (1)
G.P.	0 (0)	0 (0)	4 (9)	2 (6)	6 (29)
TRADITIONAL HEALER	28 (22)	0 (0)	5 (10)	0 (0)	33 (16)
TOTAL	126 (100)	2 (100)	47 (100)	34 (100)	209*(100)

* 209 MOTHERS WERE INTERVIEWED IN 200 HOUSEHOLDS

TABLE 43

TRANSPORT TO HEALTH FACILITY OF CHOICE (SEVERE ILLNESS)

NUMBER AND PERCENT (%)

HEALTH FACILITY	TRANSPORT				TOTAL
	WALK	CAR	TAXI	BUS	
CLINIC	67 (60)	3 (3)	29 (26)	12 (11)	111 (53)
HOSPITAL	0 (0)	0 (0)	32 (57)	24 (43)	56 (27)
G.P.	0 (0)	0 (0)	23 (59)	16 (41)	39 (19)
TRADITIONAL HEALER	3 (100)	0 (0)	0 (0)	0 (0)	3 (1)
TOTAL	70 (100)	2 (100)	84 (100)	52 (100)	209*(100)

* 209 MOTHERS WERE INTERVIEWED IN 200 HOUSEHOLDS

GOBI-FFF IN A KWAZULU RURAL COMMUNITY

1. PURPOSE

To determine the awareness and practice of GOBI-FFF in a rural community of KwaZulu.

2. OBJECTIVES

- a) To determine with regard to the study area the:
 - (i) demographic profile of the population
 - (ii) socio-economic status and environmental circumstances
 - (iii) morbidity and mortality data for children under 5 years of age
 - (iv) community awareness and practice of and opinion on GOBI-FFF
 - (v) patterns of utilization of health care resources
- b) To submit recommendations based upon the above findings to the relevant authorities concerning areas of priority need and resource allocation.

3. DEFINITION

- a) Rural community of KwaZulu:- Bomela areas served by the Bomela clinic 10km to the west of Port Shepstone, Natal.
- b) GOBI-FFF:-
 - Growth monitoring of children by use of growth charts
 - Oral rehydration therapy
 - Breast-feeding
 - Immunization
 - Female education
 - Food supplements
 - Family spacing
- c) Socio-economic Status:- Education, economic activity, occupation and marital status.
- d) Environmental circumstances:- water source and distance to it, sanitation, refuse disposal, number of people per room (in dwelling), gardening (i.e. maize plus 1 other crop).
- e) Morbidity data:- Polio, Whooping cough, TB, Measles, Gastroenteritis in the previous 6 months (children under 5 years of age)
- f) Natality Data:- Births in the last 12 months.

- g) Demographic data:- age, sex, number of people per family, marital status.
- h) Mortality Data:- Causes of death and age at death of children under 5 years of age in the previous 12 months.

4. REDUCTION OF BIAS

Sampling:- Random cluster sampling using aerial photographs of the area obtained in September 1986 by Air Survey co (Ltd).

Interviewing:- All Interviewers will be fully briefed regarding all aspects of the field research. Standardized, precoded questionnaires will be used to collect the data.

5. CONTROL GROUP

Not considered necessary for this study.

6. DATA SOURCES

- a) Literature review will be ongoing throughout the study.
- b) Personal communication with local health workers, community members and leaders.
- c) Aerial photographs from Air Survey Co (Ltd).

7. METHOD

- a) The Researcher will request permission to carry out the study from the KwaZulu health Department, Superintendents of Murchison and Port Shepstone Hospitals and local community leaders including the Chief.
- b) A standardized precoded questionnaire will be used to collect the data.
- c) Fieldwork will be conducted by a suitable person or persons who will be supervised by the Researcher. The Interviewer will be fully briefed with regard to the fieldwork and administering the questionnaire.
- d) The questionnaire will be administered to the household member present at the time of the interview who was considered by other household members present to be the most able to represent their views. Where possible this person should be the one responsible for caring for the children of the household. Should a suitable person not be present at the time of the visit a repeat visit will be arranged to meet the responsible person.

- e) A pilot study will be conducted, supervised by the Researcher, by household survey of 3 households in May 1987. A standardized questionnaire will be administered to the 3 households.
- f) The questionnaire will then be finalized using information from the pilot study.
- g) The final study will commence on 1 June 1987.
- h) Validation will be carried out by visiting two households sampled by each interviewer, and the researcher will check their questionnaires.

8. **COLLATION OF DATA**

Data from the study will be collated by the Researcher.

9. **ANALYSIS OF DATA**

Analysis will be carried out by the Researcher in terms of the Objectives of the study outlined.

10. **PUBLICATION OF FINDINGS**

A report in a format suitable for publication will be submitted to the Department of Community Health, University of Natal and to KwaZulu Health Department and other relevant authorities.

This report will be submitted in fulfilment of the requirements for Part I of M.Med.(Community Health).

11. **TIME BARRIERS**

Pilot Study	7 May 1987
Data Collection	1 June - 31 August 1987
Data Collation	1 September - 31 October 1987
Data Analysis and Report Writing	1 January - 28 February 1989
Submission of Report	June 1989

ANNEXURE B

Local Zulu terms used by the community for the "significant conditions" listed in the questionnaire.

1. PNEUMONIA:- Amacala, Izinhlangothi, Amahlaba
2. GASTROENTERITIS:- Ikhishwa isisu, Isifo zohudo, inyahambisa, uyakapalata
3. PERTUSSIS:- Umpenge, Uqhohoqhoho
4. MEASLES:- Simungumungwana, Ukuvambuka, imasisi, Umkhuhlane omkhulu
5. TUBERCULOSIS (PTB):- Isifo sofuba, Thibhi, Idliso

"Significant episodes" of morbidity referred in the study to those illnesses where the child was taken to a health facility for treatment (including traditional practitioners).

GOBI-FFF IN A KWAZULU RURAL COMMUNITY

NAME OF INTERVIEWER: _____

NAME: _____

L.O.S.: _____

HOUSEHOLD DEMOGRAPHY

	SEX	AGE	MARITAL STATUS
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

CODE:

L.O.S.: Length of stay of family in years in the defined area.

HOUSEHOLD: Persons living together as a family.

SEX: Male = 1, Female = 2

AGE: <1 yr = 1
1 - 4 yrs = 2
5 - 15 yrs = 3
16 - 44 yrs = 4
45 - 64 yrs = 5
65 + = 6

MARITAL STATE: Single = 1
Informal = 2
Formal = 3
Widowed = 4
Divorced = 5
Cohabiting = 6

QUEST NO:

--	--	--

CARD NO:

1

--	--

Male Female

--	--	--	--

SOCIO-ECONOMIC STATUS

	ECONOMIC ACTIVITY	EDUCATION	RELIGION
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

CODE:

70

ECONOMIC ACTIVITY:

less than 6 years of age = 1
 6 - 16 yrs at school = 2
 6 - 16 yrs not at school = 3
 > 16 yrs employed = 4
 > 16 yrs unemployed = 5
 old age pensioner = 6
 single care grant = 7
 disability grant = 8
 other (specify) = 9

EDUCATION (LEVEL COMPLETED):

nil = 1
 < std 5 = 2
 std 5 - 7 = 3
 std 8 - 9 = 4
 matric = 5
 other (specify) = 6

RELIGION:

Protestant (eg Baptist, Methodist) = 1
 Roman Catholic = 2
 Zionist = 3
 Traditional = 4
 Other (Specify) = 5

QUEST
NO:

--	--	--

CARD NO:

2

ENVIRONMENTAL CIRCUMSTANCES

Number of rooms used for sleeping

Number of household residents last night

Sanitation (Toilet Facility):

nil = 1
pit = 2
other (specify) = 3

Water: Distance to supply:

indoor = 1
< 100m = 2
100 - 500m = 3
> 500m = 4

Water: Main source of supply:

river = 1
borehole = 2
spring = 3
community tap = 4
tank = 5
other (specify) = 6

Refuse disposal:

nil = 1
pit = 2
other (specify) = 3

Type of garden at household:

nil = 1
own = 2
communal = 3

MORBIDITY, MORTALITY AND BIRTH DATA

FOR CHILDREN UNDER 6 YEARS

	AGE	SEX	PLACE OF BIRTH	MORBIDITY IN PREVIOUS 6/12
1				
2				
3				
4				
5				
6				

•			
•			
•			
•			
•			
•			
•			

CODE:

Age: Less than 1 year (<1); or completed years
(e.g. 18 months = 1 yr)

Sex: Male = 1, Female = 2

Place of birth: Home = 1
Clinic = 2
Hospital = 3
Other (specify) = 4

Morbidity in previous 6 months
(for children under 6 years):

Measles = 1
Gastroenteritis = 2
Pneumonia = 3
Whooping cough = 4
T B = 5
Polio = 6
Other (Specify) = 7

MORTALITY FOR ALL CHILDREN UNDER 6 YEARSIN PREVIOUS 5 YEARS

	AGE AT DEATH	PLACE OF DEATH	CAUSE OF DEATH
1			
2			
3			
4			
5			
6			

.		
.		
.		
.		
.		
.		
.		

CODE:

Age at death: = years and months if known

Place of death: home = 1
hospital = 2
other (specify) = 3

Cause of death: measles = 1
gastroenteritis = 2
pneumonia = 3
whooping cough = 4
T B = 5
polio = 6
other (specify) = 7
unknown = 8

AWARENESS/PRACTISE OF GOBI-FFFUSE OF GROWTH CHART

AGE		PRESENCE OF CHART	UP TO DATE
1			
2			
3			
4			
5			
6			

CODE:

Age: less than 1 year or completed years .

Presence of chart: yes = 1
no = 2

Up to date: yes = 1
no = 2

What do you do first if one of the children has loose stools? (Brief answer eg. got to clinic, go to traditional healer, give fluids)

Has the child minder heard of oral rehydration for loose stools?

yes = 1
no = 2

☐
☐

If yes, does the child minder know how to make the solution?

yes = 1
no = 2

☐
☐

If reply is yes, write down child minders reply to "how do you make it?"

QUEST
NO:

--	--	--

CARD NO:

3

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·		
·		
·		

Has oral rehydration therapy been used on any of the children in the home?

yes = 1
no = 2

☐
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If yes, (a) did the child die?

yes = 1
no = 2

☐
☐

(b) did the child go to hospital?

yes = 1
no = 2

☐
☐

BREAST FEEDING

	AGE	DURATION OF BREAST FEEDS	REASON FOR STOPPING
1			
2			
3			
4			
5			
6			

CODE:

Age: < 6 months = 1
7 - 9 months = 2
> 9 months (i.e. 10 months or more) = 3

Duration of breast feeds:

< 1 months = 1
1 - 3 months = 2
4 - 6 months = 3
7 - 9 months = 4
> 9 months = 5

Reason for stopping:

no milk = 1
not enough milk = 2
mother working = 3
powdered milk thought to be better = 4
weaning = 5
other (specify) = 6

IMMUNIZATION (CHILDREN UNDER 6 YEARS)

	AGE	BCG	MEASLES	DWT/DT	POLIO	STATUS
1						
2						
3						
4						
5						
6						

CODE:

Age: completed years and months (e.g. 1yr 1month
or 2yrs 0 months)

For each type of vaccination:

yes = 1
no = 2
unknown = 3

Status of immunization:

complete = 1
incomplete = 2
nil = 3
unknown = 4

Is immunization thought to be important to the
child minder?

yes = 1
no = 2

QUEST
NO:

--	--	--

CARD NO:

4

•				
•				
•				
•				
•				
•				

Briefly give child minder's reason for her answer.

PLACE WHERE CHILD WAS IMMUNIZED

	BCG	MEASLES	DWT/DT	POLIO
1				
2				
3				
4				
5				
6				

CODE:

clinic = 1
hospital = 2
mobile clinic = 3
other (specify) = 4

QUEST NO:

CARD NO:

5

Level of education of child minder

of mother

CODE:

nil

=

1

< std 3

=

2

< std 8

=

3

>= std 8

=

4

NUTRITION OF THE MOTHER DURING PRESENT PREGNANCY
OR PREGNANCY IN PREVIOUS YEAR

	DAILY 1	3-6 x/WK 2	1-2 x/WK 3	<1 x/WK 4
MAIZE				
MEAT/FISH				
MILK				
FRUIT				
BREAD				
VEGETABLES				

FAMILY PLANNING/SPACING

Have the mother(s) and grandmother(s) heard of family planning?

yes = 1
no = 2

☐☐

Have any of the members in the household used family planning methods?

yes = 1
no = 2

☐☐

If yes:

AGE		NO OF CHILDREN THE WOMAN HAS HAD	STARTED FAMILY PLANNING AT WHAT AGE	METHOD USED
1				
2				
3				
4				

From where do the women obtain their family planning services?

G.P. = 1
hospital = 2
clinic = 3
other (specify) = 4

☐☐