

World Vision Relief and Development, Inc.

**World Vision/South Africa FY96
BASELINE KPC SURVEY REPORT
Bergville District Child Survival Project
Kwazulu/Natal Province
March 16, 1996**

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**WVRD/South Africa
Bergville District Child Survival Project
KPC Baseline Survey**

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EXECUTIVE SUMMARY

A knowledge, practice and coverage (KPC) survey was carried out in the Bergville District of the Northern Drakensberg Region, in the province of Kwazulu/Natal, Republic of South Africa, between January 29th and February 2, 1996. The survey was completed with the guidance of Ms. Anne Henderson of WVRD, and with the cooperation of the Kwazulu/Natal Department of Health, and World Vision of South Africa.

The Baseline KPC survey was carried out with the specific objective of obtaining population-based data for use in defining and prioritizing the project's activities, goals and objectives based on areas of identified need. The data is especially valuable in that it was gathered from households rather than based on national figures or the observations of a few individuals within the project area. The KPC survey results were discussed by community leaders, DOH clinic, mobile clinic and hospital staff, and project personnel in order to provide background information for the development of the project plans as outlined in the Detailed Implementation Plan.

World Vision Relief and Development (whose headquarters are in Washington, D.C.) and World Vision of South Africa are supporting the implementation of Bergville District Child Survival Project, a Child Survival XI Project. The project received a USAID grant from the Child Survival and Health Office of the Private and Voluntary Cooperation Bureau for Food and Humanitarian Assistance, to implement a Child Survival Program for a potential beneficiary population of 130,000, from October 1, 1995 to September 30, 1999.

The questionnaire contained 50 questions and was used to collect information from mothers of children under 24 months of age. The questions were based on a standardized survey format recommended and provided by USAID Child Survival Support Office. The project management of Bergville Child Survival Project, in collaboration with World Vision's Regional Health Support person, customized the standardized survey questionnaire to adapt the instrument to the project's needs in regard to project interventions and objectives for the project area. A selected team of 30 DOH staff and project people participated in a three day training program in the "30 cluster sample" survey methodology, enabling them to competently conduct this type of survey and measure the projects progress. Six teams of 3-4 interviewers each and a supervisor conducted the 30 cluster Baseline survey. Each cluster yielded 10 household interviews of mothers with children less than two years of age. A total of 306 interviews were completed and 297 were used in the results.

Some of the major findings of the survey include: 73.4 % of mothers started solids before 4 months and only 11% knew to use colostrum; 31% of mothers with children with diarrhea in the previous two weeks gave less fluids or stopped fluids, and only 12.5% knew that signs of dehydration are cause for referral; 82.4 % of non-pregnant mothers did not want another pregnancy within the next two years and of these 72% are using a modern method of contraception; 93.6% had heard about AIDS but many adhere to myths about transmission, and 57.2% of mothers felt that they were personally at risk for AIDS.

List of Abbreviations

| | |
|-----------------|--|
| ANC | African National Congress |
| ARI | Acute Respiratory Infection |
| ATICC | AIDS Training, Information, and Counseling Center (Pietermaritzburg) |
| BDCSP | Bergville District Child Survival Project |
| BDHF | Bergville District Health Form |
| BERGNET | Bergville Network of Service Providers |
| CBDO | Community-Based Development Organization |
| CBGM | Community-Based Growth Monitoring |
| CDD | Control of Diarrheal Disease |
| CEP | Community Empowerment Program |
| CHA | Community Health Advisor |
| CHF | Community Health Facilitator |
| CHW | Community Health Worker |
| CS | Child Survival |
| CSIR | Council for Science and Industrial Research |
| CSP | Child Survival Project |
| CT | Community Trainer |
| DIP | Detailed Implementation Plan |
| DFPTC | Durban Family Planning Training Center |
| DHS | District Health System |
| DOH | Department of Health |
| EPI | Expanded Program on Immunization |
| FP | Family Planning |
| GDP | Gross Domestic Product |
| GNU | Government of National Unity |
| ha | Hectare(s) |
| HDP | Hypertensive Disease of Pregnancy |
| HIS | Health Information System |
| HSRC | Human Sciences Research Council (SA University-Linked Research Organization) |
| HST | Health Systems Trust (South African Research/ Training/Information Dissemination NGO) |
| IGA | Income Generating Activity |
| JHU CSSP | Johns Hopkins University PVO Child Survival Support Program |
| KPC | Knowledge, Practice and Coverage |
| KZN | Kwazulu/Natal |
| LHC | Local Health Committee |
| MC | Maternal Care |
| MCH | Maternal/Child Health |
| MIS | Management Information System |
| NGO | Nongovernmental Organization |
| NHP | National Health Plan |
| NHPD | National Health and Population Development |
| NTF | Nutritional Task Force |
| ORT | Oral Rehydration Therapy |

| | |
|---------------|--|
| PHC | Primary Health Care |
| PNMR | Perinatal Mortality Rate |
| PRA | Participatory Rural Appraisal |
| PVO | Private Voluntary Organization |
| RDP | Reconstruction and Development Plan |
| RSA | Republic of South Africa |
| SCM | Standard Case Management |
| SLOT | School Leavers Opportunity Training |
| STD | Sexually Transmitted Disease |
| TASO | The AIDS Support Organization |
| TJSB | Thukela Joint Services Board |
| TOT | Training of Trainers |
| UNICEF | United Nations' Children's Fund |
| WCBA | Women of Childbearing Age |
| WHO | World Health Organization |
| WVI | World Vision International |
| WVRD | World Vision Relief and Development |
| WV/SA | World Vision/South Africa |
| ZNRC | Zamimpilo Nutritional Rehabilitation Center |

***NOTE:** The Upper Thukela /Bergville Child Survival Project (UT/CSP) as titled in the proposal, is now known as the Bergville District Child Survival Project (BDCSP) for the purpose of this Detailed Implementation Plan. Both refer to the same project and project area. BDCSP more accurately reflects the change from a fragmented community into what is now one geographical unit.

I. INTRODUCTION

A. Background

World Vision Relief and Development, whose headquarters are in Washington, D.C. and World Vision/South Africa are supporting the implementation of Bergville District Child Survival Project, a Child Survival XI Project, based in the Northern Drakensberg area of KwaZulu/ Natal Province, Republic of South Africa. The project received an USAID grant from the Child Survival and Health Office of the Private and Voluntary Cooperation Bureau for Food and Humanitarian Assistance, to implement a Child Survival Program from October 1, 1995 to September 30, 1999.

The project area situated in the northern Drakensberg of KZN, encompasses 40 communities, with a predominately black population of 130,000. This site was chosen because: (1) The maternal/child morbidity and mortality rates of this predominately black, rural population are higher than the national average; (2) The District Department of Health has a strong interest in improving linkages with the community and developing a community-based primary health care approach; and (3) WVSA has a 15-year history of partnership with the community and clinics in this area with nutrition education/rehabilitation programs, community health workers' training, youth education (health, sexuality and AIDS education), training of preschool and creche educators, income generation, revolving loans, community-based rehabilitation of the mentally and physically disabled and the formation of a Christian Development Association which facilitates the involvement of local churches in development activities.

Current perinatal mortality rate(PNMR) and infant mortality rates (IMR) are not available for KwaZulu/Natal(KZN), the province in which the project is located. However, a 1994 study in the project area showed a PNMR of 45/1000, and an IMR of 36/1000 births. A 1988 estimate of PNMR in KZN was 41 deaths/1,000 births. The most frequent causes of perinatal deaths in the region are associated with pre-term labor, infections, stillbirths, hypertension, and abruptio placentae. Physicians in the Bergville District report congenital syphilis as being a major contributor to stillbirths. A 1990 government estimate cites KZN's IMR of 44.7 deaths/1,000 births as being the third highest in the country. Although childhood morbidity due to diarrhoeal disease and ARI has decreased considerably since 1976, conservative estimates suggest that 25,500 children in RSA still die each year from these preventable causes.

The focus of the Bergville District Child Survival Project (BDCSP) is to reduce maternal, infant and child morbidity and mortality by improving the technical and management capacity of the Kwazulu/Natal DOH and Bergville District Health Forum to deliver effective Child Survival interventions, and to facilitate genuine community involvement in health care delivery.

B. Project Objectives:

1. To enhance the delivery of EPI, growth monitoring, nutrition, antenatal care and family planning, CDD, ARI and HIV/AIDS messages and services to infants, children under 5 years of age and women of child bearing age in the project area through the following activities:

- a. Updating the technical skills of the DOH personnel to deliver CS interventions.
 - b. Improving management skills of the DOH to plan, deliver, monitor and evaluate their CS activities
 - c. Assisting the underserved and previously unreached communities, through PRA exercises, to nominate and organize health promoters and educators who will encourage the utilization of CS messages and services at the household and community levels.
2. To facilitate the integration of the community resources with the DOH infrastructure and programs to establish a sustainable and cost effective delivery system for CS interventions.
 3. To enhance the capacity of WVSA to improve child survival-related program activities in the context of its development activities.

The program interventions along with the percent of time that the project will dedicate to each area are as follows:

| | |
|---|-----|
| Maternal and child care and family planning | 15% |
| Nutrition and Breastfeeding | 25% |
| Immunization (EPI) | 10% |
| Acute respiratory infection (ARI) | 15% |
| HIV/AIDS/STD | 20% |
| Control of diarrhoeal disease (CDD) | 15% |

USAID requires PVOs with new FHA/PVC Child Survival grants to conduct a 30-cluster baseline survey using a standardized questionnaire developed by JHU. As part of this required process, a WVRD regional support person, Ms. Anne Henderson, who has undergone the CSSP/ KPC Survey Training of Trainers course and implemented several KPC surveys in the past, came to the project site to train staff in the organization of the standardized questionnaire, the purpose of each question, as well as adaptation of the questionnaire to program objectives. The project staff were trained to conduct a standard WHO 30-cluster survey, and in tabulation, analysis, and development of a report from the completed survey questionnaires.

C. Survey Objectives:

The Baseline KPC Survey was carried out as a component of the project start-up with the specific objective of obtaining population-based data which could be used to further define and prioritize the project's activities, goals and objectives based on areas of identified need. The information obtained is especially valuable as it was gathered from the project area's households rather than based on national figures or on the observations of a few individuals within the area.

The questionnaire used in the survey was targeted towards obtaining information which is related to health status and health indicators which contribute towards increasing child survival and health among women of child bearing age. The information collected included:

- Mothers' education level, income generation activities and the presence of caregivers.
- Knowledge of mothers of children under two years of age about: breastfeeding/infant feeding practices; management of diarrhea episodes and acute respiratory illness; the immunization schedule; need for prenatal care and

assistance with high-risk pregnancies; and transmission and prevention of HIV/AIDS.

- Actual practices of mothers in regards to breastfeeding, nutrition, growth monitoring, immunization, treatment of diarrhea and acute respiratory infection, use of family planning methods, and drinking water source.
- Target groups for health education messages.
- For children aged 12-23 months: the coverage rates of BCG, DPT-3, OPV-3, measles vaccines and drop-out rates.

As the project will focus on changing mother's knowledge and practices regarding some basic preventative health practices, the survey will provide useful information for the planning, managing and evaluation of progress towards objectives.

The information is to be shared with health committee groups and various healthcare supervisors working within the Ministry of Health, and will serve as a vehicle to link the health sectors with the communities they serve as they learn more about the knowledge and practice status of the women and children in their service areas.

D. Schedule of Activities

| | |
|--------------------|--|
| Nov. 17-19, 1995 | Meeting with Core Group regarding survey preparations and KPC survey methodology |
| Jan. 22 - 24, 1996 | Training of supervisors and interviewers |
| Jan. 25 | Field training exercise and discussion |
| Jan. 29 - Feb. 2 | Conduct of survey interviews |
| Jan. 30 - Feb. 3 | Analysis of Survey Results (EPI-INFO) |
| Feb. 5 | Group discussion of results and implications; preparation for community feedback session |

II. METHODOLOGY

A. The Questionnaire

The questionnaire contained 50 questions and was used to collect information from mothers of children under 24 months of age. The questions were based on a standardized survey format recommended and provided by USAID Child Survival Support Office. The project management of Bergville Child Survival Project, in collaboration with World Vision's Regional Health Support

person, Ms. Anne Henderson, customized the standardized survey questionnaire to adapt the instrument to the project's needs in regards to project interventions and objectives for the project area.

The first two questions ask the age of the mother and her youngest child (< 24 months); questions 3 - 5 collect data regarding mother's literacy, employment, and who cares for the child when the mother is away from home; questions 6 - 11 deal with breastfeeding and other infant feeding practices; questions 12 - 15 ask questions concerning the child's attendance at growth monitoring sessions, possession of a growth monitoring card, and immunizations received; questions 16 - 18 refer to the mother's knowledge regarding measles and tetanus vaccine; questions 19 - 28 refer to diarrheal disease and management of the child with diarrhea; questions 29 - 30 inquire about drinking water and latrine facilities; questions 31 - 35 ask about prevalence and management of the child with acute respiratory infection; questions 36 - 43 ask about knowledge and practices related to pre-natal care, delivery practices and family planning; questions 44 to 48 are related to HIV/AIDS transmission and prevention; and finally, questions 49 and 50, ask about leaders and organizations present within the community.

The questionnaire was originally written in English and then translated by project staff into Zulu and then translated back into English. (Annex Sample English and Zulu questionnaires)

B. Determination of Sample Size

The sample size was calculated with the following formula:

$$n = z^2(pq)/d^2$$

where: **n** = sample size

z = statistical certainty chosen

p = estimated prevalence/coverage rate/level to be investigated

q = 1 - p

d = precision desired

The value of **p** was defined by the coverage rate that requires the largest sample size (**p** = .5), seeing that many different variables were being looked at. The value **d** which depends on the precision, or margin of error, desired was set at **d** = .1. The statistical certainty was chosen to be 95% (**z** = 1.96). Given the above values, the following sample size (**n**) needed was:

$$n = (1.96 \times 1.96)(.5 \times .5)/(.1 \times .1)$$

$$n = (3.84)(.25)/.01$$

$$n = 96$$

It would be a very time-consuming and expensive exercise to randomly select an identified individual from the survey population, and then perform this selection 96 times to identify a sample of **n** = 96. It is also important to note that lists of every individual in the population were not available. In order to save time and resources, a 30 cluster sample survey in which several individuals within an area (cluster) are selected to reach the required sample size was chosen.

Surveying in a cluster creates a bias as individuals who live near each other are more likely to be similar to one another. In order to compensate for this bias, experience has shown that the sample size should be doubled.

Given the values of p, d, and z as stated above, a minimum sample of 210 (7 per cluster) is required (Henderson, et. al., 1982). In general, when using a 30 cluster sample survey, the sample size used should be approximately double the value n, when: $n = (z \times z)(pq)/(d \times d)$. In this case, a sample size of 300 (10 per cluster) was selected so as to ensure that sub-samples (sets of questions related to diarrhea and respiratory infection which will not be answered by all mothers) would be large enough to obtain useful management source information. A number which was divisible by 30 was chosen to facilitate the process.

C. Selection of the Sample

The sample consisted of 300 women with children (0-23 months) living in the communities of the Bergville Districts in the province of KwaZulu/Natal, South Africa. Ten mothers with children (0 - 23 months) from different households were selected in each of the 30 randomly selected cluster sites.

The district was divided into clusters based on primary school sites. This method was used since the area does not naturally fall into villages or communities; individuals are dispersed throughout the districts and many live on farms. The modified cluster sampling method recommended and tested by Peter W. Kok from the Medical Research Center, Kenya Medical Research Institute, was designed for areas with dispersed populations and can be used in areas where over 70% of children have access to and attend educational institutions. It was felt that the 54 primary schools located in Bergville district clearly covered all areas of the district and when randomly chosen clusters were marked on the map, a very wide range of areas was included. School attendance for the district is estimated to be greater than 75%.

It should be noted that due to tribal violence in the Ngoba Area, it was considered unsafe to do interviews in this area. The three primary schools situated there were withdrawn from the sampling frame. This left 51 primary schools from which the clusters were selected. It was felt the exclusion of the Ngoba area would not adversely affect the results, as this area is not distinct from the rest of the Bergville District.

Verbal and written permission was obtained from the school superintendent for the district and all school principals were informed of the purpose and objectives of the KPC Survey and what involvement would be needed. The cooperation of the school principals and teachers throughout the survey process is to be highly commended. In schools where clusters were randomly selected, a number between zero and the number of SSA (primary class) children was chosen from the random number table. The children in the SSA class were then lined up mixing boys and girls and were counted off until the random number was reached. This child was then removed from the line. In larger schools where two clusters were selected, a second child was also taken aside, counting off from the point at which the first child was selected. It was necessary to choose two clusters from two of the schools during the survey, but all other schools randomly selected only required one. The child removed from the line was taken aside along with his teacher to explain that his home would be used to identify a starting point for the survey. If

the child had an older sibling in the same school, that child was called for instead and the younger child was returned to his class.

With the permission of the child and teacher, the child was taken to his home where an explanation was given to his mother. The child was then returned by the driver to the school. The survey team followed a protocol whereby the child's house itself was never used as the actual starting point for the survey. A possible bias could have arisen by choosing homes with children privileged enough to be in school. The first house in the cluster was instead the house closest to the home of the child selected from the school. If there were a mother with a child (0 - 23 months) in the home, and if she granted him permission, the first interviewer was left at this house to begin his questionnaire. The rest of the team then continued to the next house to see if there were a mother with a child (0 - 23 months). This process was repeated until ten households with mothers of children (0 - 23 months) had been interviewed. The same process was conducted for each cluster.

Each of the six survey teams was made up of one supervisor and three interviewers. The supervisor was responsible for selecting children from the primary school and for selecting each subsequent household where interviews were conducted. The supervisor was also responsible for observing at least one interview per interviewer per day and for reviewing and signing each questionnaire for its completeness and accuracy before leaving the cluster area. The interviewers were responsible for following the supervisor's instructions as to which household to interview, for conducting the interview and for reviewing it for completeness before handing it over to the supervisor.

The team is to be highly commended for their persistence and effort throughout the week the interviews were conducted. Since it was rainy season and flooding had been occurring in the area, much time was spent getting cars out of the mud. Also, great distances had to be covered on foot across muddy, swampy fields, up mountains, and through rivers, because most of the homes were inaccessible by car.

D. Training of supervisors and interviewers

The Bergville Child Survival Project Management Team selected supervisors and interviewers for training. The supervisors selected were Ministry of Health officers involved in district community health services who will be involved in project activities over the next 4 years. The interviewers included Sexuality Education Motivators, who are project staff; the nutrition "mother", who is part of a community project in Bergville; and village health workers, who are paid by the Tribal Authorities. All of these individuals will collaborate with the project in the future.

The training of the core team took place in November, 1995 over a three-day period and included the project director and manager, and four community health district supervisors. Topics covered included: KPC methodology, objectives and purpose of the survey, preparation for the survey including division of the population for cluster selection, criteria for the selection of supervisors and interviewers, preparation of the questionnaire in coordination with proposed indicators and objectives set in the proposal, translation of the questionnaire, selection of dates for the survey, and logistical requirements. Also present for the core team training were two UNICEF-sponsored

individuals from the Nutritional Task Force who had previously conducted a survey in neighboring districts using primary schools for cluster selection. They were given the opportunity to explain their methods and share their experiences and "lessons learned", which was helpful and greatly appreciated.

The training for the KPC survey supervisors and interviewers took place over a four-day period just before the survey. The first day of training for the core team and supervisors covered the topics of purpose and objectives of the KPC survey, rapid KPC survey methodology, choosing of clusters using primary schools, household selection, role of the supervisor and interviewer, review of questionnaire, interviewing principles, filling-in of the questionnaire, practice interviews and feedback, and materials needed. Four of the supervisors prepared "good" and "bad" interview role-plays for use in training interviewers the following day.

The next two days of training included both supervisors and interviewers. Topics covered during day two included: brief description of the child survival project and review of its goals and objectives; purpose and objectives of the KPC survey; randomness in selecting a sample; protocol for conducting surveys; role of supervisors and interviewers; interviewing principles; review of the questionnaire; and a role play on interviewing. On day three, the following topics were covered: review of interviewing principles; obtaining consent and emphasis on confidentiality; practice interviews and feedback in groups of two and three with supervisors monitoring; cluster and household selection; practical exercises in calculating ages of children and filling out immunization data from the health card; and review of the process of a field survey in preparation for the field exercise.

Day four of the training was the actual field/pilot test day at which time the teams went to a primary school (a school from where a cluster was not selected), spoke with the principals and teachers, and then randomly chose a child from the SSA class. They then when to his home. The process of using the next closest house for the first and following interviews was followed. Every interviewer conducted at least one interview. At the end of the day, the teams met in their small groups and then came together as a large group to share their experiences and "lessons learned". There was then a review of the key components of interviewing in preparation for the actual survey. These included: materials needed; cluster sites; cluster and household selection; sample to be interviewed; obtaining consent; filling-in of the questionnaire; review of questionnaires for completeness by the interviewer and supervisor before leaving cluster area; and turning in of questionnaires to survey coordinator for review at the end of each day.

E. Conduct of the Interviews

The survey was conducted over five consecutive days: January 29 - February 2, 1996. Thirty survey areas (clusters) were randomly selected using the process described in Section C above. The survey coordinator (who is also the Project Manager) along with the core team then assigned each team to the various clusters/areas.

The supervisors of each team were responsible for taking each randomly-selected child to his home and using the next closest house as the starting point for that cluster of ten households. The supervisor then instructed the team to continue proceeding to the next closest house until ten households with mothers of children (0 - 23 months) had been interviewed. The supervisors observed at least one complete interview by each surveyor each day. Each questionnaire was checked for completeness before the survey team left the survey area, so that in the case of missing or contradictory information, the mother could be visited again the same day. Very few difficulties were encountered in determining the child's age as almost all the children had

a Road to Health card or some type of identity card indicating the birth date. Difficulties was encountered in establishing the ages of some mothers, who were unable to supply adequate information.

A consent form was read to each mother before commencing with the survey. The consent form covered essential issues including: the mother was not obligated to participate in the survey, and no consequences or biases would arise if she chose not to participate; all information would be confidential and would be used to help health workers plan health activities which would help better meet the needs of the community; she could end the interview at any point; she should not be alarmed by the interviewer writing down her responses.

F. Method for Data Analysis

The data was analyzed using EPI - INFO 5.1, developed at the Centers for Disease Control (CDC) in Atlanta, and designed specifically for the analysis of health surveys. The program is inexpensive, easy to learn, and "user-friendly". The questionnaire structure was entered into the computer by the administration/finance manager and reviewed by the WVRD regional support person and the project director who is also a physician within the department of health. The structure was tested using the questionnaires completed on the field test day. This was also used as an opportunity for the three data enterers to practice and become familiar with the process. During the actual survey week, completed questionnaires from each day were entered into EPI-INFO 5.1 the next day by a team of three data enterers. At the end of each day they performed record by record checks of each others' entries. The questionnaires were completely entered by Saturday, February 3rd, 1996, the day following the last survey day. Three questionnaires were discarded because the child in each case had turned 24 months within five days of the interview date. This left a total of 297 questionnaires. An additional six questionnaires were completed during the survey but were not counted in the analysis.

For the first feedback session, when the survey team began to work with the KPC results and prepare presentations for community/ hospital/ clinic feedback, frequency distributions for each of the questions and a few key cross-tabulations in relation to child survival indicators were presented.

Immunization coverage was analyzed for children (12-23 months). By restricting the sample to children of these ages, the percentage of children fully immunized within the first year of life can be estimated. To further explain, a child only three months old has not yet had sufficient time to receive his full course of immunizations, therefore it would not be correct to include this age group. By using the group of children (12-23 months) as those who should be fully immunized, the assumption can be made that the percentage of children in the project area who receive the full set of immunizations by the age of 12 months is equivalent to the percent of the 12-23 month olds. Specific age groups of children in the survey were used as indicated in the definitions of key child survival indicators, for example, with exclusive breastfeeding, the introduction of solid foods and the continuation of breastfeeding.

Three days after the survey, when the frequency tables and cross-tabulations were finalized, the survey team met with supervisors from the clinics, hospital and community health committees to discuss the results of the survey. During this five-hour session, general results were reviewed. The group was then divided into 6 teams, with each team focusing on a different intervention; the task was to review the survey results and address some key issues, such as implications relating to program planning. Each team prepared a presentation sharing results and conclusions with the group. Dramas and posters were used to share the survey results. It was a very profitable

exercise in furthering the survey team's understanding of child survival interventions. The basic material developed will serve as a basis for the presentations to follow at the various clinic and community sites.

III. RESULTS

Identification Module

- Q1. The mean age reported by mothers surveyed was 27 years. 5.0% of mothers surveyed (15 out of 297) were under 18 years of age. 12.9% or 38 mothers surveyed were over 35 years.
- Q2. 65 (or 22%) of children in the survey were under four months of age. 69% (205 out of 297) children in the survey were under the age on one year; children 0-11 months. 31% (101 out of 297) of the children in the survey were 12-23 months of age. The mean age of children in the survey was 9.0 months.

| AGE CHILD | Freq | Percent | Cum. |
|-----------|------|---------|--------|
| 0 | 18 | 6.1% | 6.1% |
| 1 | 18 | 6.1% | 12.1% |
| 2 | 19 | 6.4% | 18.5% |
| 3 | 10 | 3.4% | 21.9% |
| 4 | 27 | 9.1% | 31.0% |
| 5 | 20 | 6.7% | 37.7% |
| 6 | 18 | 6.1% | 43.8% |
| 7 | 16 | 5.4% | 49.2% |
| 8 | 13 | 4.4% | 53.5% |
| 9 | 12 | 4.0% | 57.6% |
| 10 | 12 | 4.0% | 61.6% |
| 11 | 13 | 4.4% | 66.0% |
| 12 | 9 | 3.0% | 69.0% |
| 13 | 12 | 4.0% | 73.1% |
| 14 | 7 | 2.4% | 75.4% |
| 15 | 8 | 2.7% | 78.1% |
| 16 | 18 | 6.1% | 84.2% |
| 17 | 6 | 2.0% | 86.2% |
| 18 | 12 | 4.0% | 90.2% |
| 19 | 6 | 2.0% | 92.3% |
| 20 | 6 | 2.0% | 94.3% |
| 21 | 5 | 1.7% | 96.0% |
| 22 | 5 | 1.7% | 97.6% |
| 23 | 7 | 2.4% | 100.0% |
| Total | 297 | 100.0% | |

Mother's Education and Occupation Module

- Q3. In sum, 30.6% of mothers said they could not read. Of the 206 mothers who said they could, 87 (42.2%) could read only at the primary level.

| Level of Education | % Breakdown |
|-----------------------------|--------------------|
| No formal education | 63 (21.2%) |
| Primary school, cannot read | 28 (9.4%) |
| Primary school, can read | 87 (29.3%) |
| Secondary school or higher | 119 (40.1%) |

Q4. **Income generating activities**

| Income generating Activity | % Breakdown |
|-----------------------------------|--------------------|
| No income generating work | 218 (73.4%) |
| Hawkers | 28 (9.6%) |
| Handicrafts | 25 (8.6%) |
| Casual laborers | 4 (1.4%) |
| Selling home-prepared foods | 6 (2.0%) |
| Domestic worker | 4 (1.4%) |
| Shopkeeper | 1 (0.3%) |
| Salaried | 7 (2.4%) |
| Baby sitter | 1 (0.3%) |
| Traditional healer | 2 (0.6%) |

Q5. Details of the child's caregiver.

| Details of Caregiver | Percentage Breakdown |
|----------------------|----------------------|
| Child's Mother | 117 (39.4%) |
| Child's Grandmother | 131 (44.1%) |
| Older Children | 25 (8.4%) |
| Husband/Partner | 1 (0.3%) |
| Other relations | 15 (5.1%) |
| Neighbors/Friends | 8 (2.7%) |

Breastfeeding/Nutrition Module

Q6. 84.2% (250) mothers reported they were breastfeeding their child. Of those mothers with children (20-23 months), 15 mothers (65.2%) were still breastfeeding their child (out of 23).

Q7. Of the 47 mothers who were not breastfeeding their child, 10 (21.3%) mothers reported they had never breastfed in the past.

Q8. Initiation of breastfeeding

| Breastfeeding Practice | % Breakdown |
|------------------------|-------------|
| During first hour | 139 (48.6%) |
| Between 1 - 8 hours | 89 (31.1%) |
| More than 8 hours | 46 (16.1%) |
| Could not remember | 12 (4.2%) |

Q9. Of the children 0, 1, 2 and 3 months of age (65 children), 24 children (36.9%) were being exclusively breastfed; in other words, they were not being given any of the food/fluid categories listed in question 9 (9.1-9.13).

Of the children 5, 6, 7 and 8 months of age (67 children), 89.6% had been introduced solid or semisolid foods; in other words, they were being given at least one of the non-fluid categories listed in question 9.

Q10. Sustained breastfeeding in the child's first four months of life.

| Sustainability of breastfeeding | % Breakdown |
|---------------------------------|-------------|
| No knowledge | 127 (44.4%) |
| Breastfeed as soon as possible | 32 (11.1%) |
| Care of breasts | 40 (14.0%) |
| Frequent sucking | 37 (12.9%) |
| Exclusive breastfeeding | 52 (18.2%) |
| Relactation | 3 (1.0%) |
| Intake of extra fluids | 8 (2.8%) |
| Eat well | 17 (5.9%) |
| Other | 13 (4.6%) |

Q11. Introduction of solids. In sum, 84.8% (252) did not know that mothers should give their children food in addition to breastmilk between four and six months of age.

| Introduction of Solids | % Breakdown |
|------------------------|-------------|
| Before 4 months | 218 (73.4%) |
| Between 4 - 6 months | 45 (15.2%) |
| After 6 months | 9 (3.0%) |
| Did not know | 25 (8.4%) |

Immunization Module

Q12. 93.3% of mothers said their children had received at least one immunization, and 87% had an immunization card for their child.

Growth Monitoring Module

Q13. 86.9% of mothers (258 of 297) in the survey had a growth monitoring card for their child. Eighteen (6.1%) said they had lost it, and 21 (7.1%) said they never had one.

Q14. 83.7% of the mothers (216 of 258) whose child had a card said their child had been weighed in the four months prior to the survey.

Q15. The immunization status for children (12-23 months) is based on the immunization card actually seen by the interviewers. There were 101 children in the survey (12-23 months). The following are coverage figures for BCG, HBV, OPV, DPT, and measles:

BCG Status (N=101)

| NO BCG | YES BCG |
|------------|------------|
| 19 (18.8%) | 82 (81.2%) |

HBV Status N=101

| HBV 1 | HBV 1,2 | HBV 1,2,3 | Drop Out |
|-----------|----------|-----------|----------|
| 10 (9.9%) | 8 (7.9%) | 5 (5%) | 5 (50%) |

OPV Status (N=101)

| OPV 1 | OPV 1,2 | OPV 1,2,3 | Drop Out |
|------------|------------|------------|------------|
| 94 (93.7%) | 80 (79.2%) | 70 (69.2%) | 24 (25.5%) |

DPT Status (N=101)

| DPT 1 | DPT 1,2 | DPT 1,2,3 | Drop Out |
|------------|------------|------------|------------|
| 76 (75.2%) | 73 (72.3%) | 58 (57.4%) | 18 (17.8%) |

Measles Status (N=101)

| NO MEASLES | YES MEASLES |
|------------|-------------|
| 29 (8.7%) | 72 (71.3%) |

Fully Immunized Status (BCG + OPV123 + DPT123 + Measles)

| Fully Immunized | Not fully Immunized |
|-----------------|---------------------|
| 54 (53.5%) | 47 (46.5%) |

Q16. In sum, 92.9% of mothers did not know that a child should receive the measles vaccine at nine months of age.

| Measles Immunization | % Breakdown |
|----------------------|-------------|
| 9 months | 13 (4.4%) |
| 6 months | 21 (7.1%) |
| Other than above | 263 (88.5%) |

Q17. 211 mothers (71.0%) did not know why a pregnant woman should receive the TT vaccine, and 5.1% offered combinations of the categories listed.

| Reason for Tetanus Toxoid | % Breakdown |
|---------------------------|-------------|
| Protect mother & infant | 45 (15.2%) |
| Protect mother | 1 (0.3%) |
| Protect infant | 25 (8.4%) |
| Did not know | 211 (71.0%) |

Q18. In sum, 31.7% of mothers stated that a pregnant woman needs at least two TT injections to protect the newborn infant from tetanus.

| No. of Tetanus Toxoid Injections Required | % Breakdown |
|---|-------------|
| Two | 42 (14.1%) |
| More than two | 52 (17.5%) |
| Did not know | 203 (68.4%) |

Diarrheal Disease Module

Q19. 57.2% (170 of 297) of the mothers surveyed stated that their child had diarrhea within the two weeks prior to the survey.

Q20. Of the 170 children with diarrhea during the two weeks prior to the survey, 146 were still being breastfed.

| Breastmilk during Diarrhea | % Breakdown |
|----------------------------|-------------|
| More breastmilk given | 21 (12.4%) |
| Same as normal | 78 (45.9%) |
| Less than normal | 47 (27.7%) |
| Stopped breastfeeding | 7 (4.1%) |

Q21. In sum, 54.1% of the 170 children were being given fluids other than breastmilk more or the same amount as usual during the diarrheal episode.

| Other Fluids given | % Breakdown |
|-------------------------|-------------|
| More fluids than normal | 45 (26.5%) |
| Same as usual | 47 (27.7%) |
| Less than usual | 47 (27.7%) |
| Stopped giving fluids | 6 (3.5%) |

Q22. In sum, 69.4% of the children were being given foods more or the same amount as usual and 41.8% gave less food or stopped giving food completely during their child's diarrheal episode.

| Solids or semi-solids given | % Breakdown |
|-----------------------------|-------------|
| More than usual | 14 (8.2%) |
| Same as usual | 41 (24.0%) |
| Less than usual | 63 (37.1%) |
| Stopped giving food | 8 (4.7%) |

- Q23. Of the 170 children with diarrhea during the two weeks prior to the survey: 127 children (74.7% of 170) were given at least one of the ORT categories listed in question 23 (23b-23e).

| ORT solutions administered | % Breakdown |
|-----------------------------------|--------------------|
| Sugar salt solution | 68 (40.0%) |
| ORS sachets | 51 (30.0%) |
| Cereal based fluids | 8 (4.7%) |
| Medicine | 15 (8.8%) |
| Other treatment | 15 (8.8%) |

- Q24. Of the 170 mothers of children with diarrhea during the two weeks prior to the survey, 111 (65.3%) sought advice or treatment for their child's diarrhea.

- Q25. The following were contacted for advice.

| Source of Treatment | % Breakdown |
|----------------------------|--------------------|
| Hospital | 15 (13.5%) |
| Clinic | 68 (61.3%) |
| Doctor | 20 (18.0%) |
| Pharmacist | 6 (5.4%) |
| Other | 11 (9.9%) |

- Q26. The signs & symptoms which would cause a mother to seek advice are as follows.

| Signs & Symptoms associated with Diarrhea | % Breakdown |
|--|--------------------|
| Dehydration | 37 (12.5%) |
| Tiredness & weakness | 76 (25.6%) |
| Fever | 94 (31.6%) |
| Prolonged Diarrhea | 92 (31,0%) |
| Vomiting | 58 (19.5%) |

| | |
|------------------|------------|
| Blood in stools | 42 (14.1%) |
| Loss of appetite | 85 (28.6%) |
| Continual crying | 19 (6.4%) |
| Other | 48 (16.2%) |

Q27. Important actions to be taken in the event of diarrhea.

| Action taken with Diarrhea Cases | % Breakdown |
|---|-------------|
| Proper mixing & administration of (SSS) | 137 (46.1%) |
| Seek medical help | 184 (62.0%) |
| Smaller frequent feeds | 7 (2.4%) |
| Initiate fluids rapidly | 25 (8.4%) |
| More to drink | 7 (2.4%) |
| More to eat | 7 (2.4%) |
| Other | 26 (8.8%) |

Q28. 147 mothers (49.7%) said they gave smaller but more frequent feeds. Five mothers indicated they try to supplement the child's feeding with high protein, nutritious meals including fruit. 48.6% of the mothers did not know.

Q29. 203 (68.4%) mothers responded positively to the question on whether they have a toilet in their homes.

Q30. 167 (56.4%) mothers indicated they source their water supply from boreholes, 7 (2.4%) from rivers, 28 (9.5%) from protected springs, 55 (18.6%) from unprotected springs and 2 (0.7%) from dams. 10.9% had to make use of multiple sources.

Respiratory Illness

Q31. 108 mothers (36.4%) indicated that their child had been ill with a cough or experienced difficulties in breathing in the last two weeks.

Q32. 86 mothers indicated that their child had experienced rapid and difficult breathing (dyspnea), while 1 mother did not know.

Q33. 73 (84.9%) of the 86 mothers indicated above sought medical assistance

Q34. 71.2% (52 mothers) sought assistance from a hospital or clinic, 15 (20.3%) from a doctor and 9 (12.3%) from traditional methods.

Q35. Symptoms of ARI

| Symptoms of ARI | % Breakdown |
|------------------|-------------|
| Dyspnea | 124 (41.8%) |
| Loss of appetite | 54 (18.2%) |
| Fever | 72 (24.2%) |
| Coughing | 60 (20.2%) |
| Groaning | 44 (14.8%) |
| Wheezing | 54 (18.2%) |
| Other | 45 (15.2%) |

Maternal Care

Q36. Ante-Natal visits

| Ante-Natal visits | % Breakdown |
|--------------------|-------------|
| Three or more | 240 (80.8%) |
| Between one & two | 21 (7.1%) |
| Zero | 12 (4.0%) |
| Could not remember | 24 (8.1%) |

Q37. Nine mothers (3.3%) said they were pregnant or were not sure.

Q38. Of the 288 mothers who said they were not pregnant, 48 (16.7%) said they wanted to have a child in the next two years. 240 mothers (83.3%) either did not want to have a child in the next two years, or were undecided.

Q39. Of the 240 mothers who either did not want to have a child in the next two years, or were undecided, 173 (72.1%) stated they were using a contraceptive method. The remaining 67 (28%) mothers were not.

Q40. Of the forms of contraception used, 173 mothers were using some contraceptive method; 168(95.4%) were using a modern method; in other words, they indicated one of the first five methods listed in question 40.

| Form of Contraception used | % Breakdown |
|----------------------------|-------------|
| Contraceptive injections | 124 (71.7%) |
| The pill | 30 (17.3%) |
| Other | 19 (11.0%) |

Q41. When asked how soon a woman should see a health professional after she knows she is pregnant the following results were obtained.

| First Ante-Natal visit | % Breakdown |
|------------------------|-------------|
| First Trimester | 232 (78.1%) |
| Second Trimester | 33 (11.1%) |
| Third Trimester | 7 (2.4%) |
| Did not know | 25 (8.4%) |

Q42. When asked what signs would indicate the need for referral the following was answered.

| Important signs in pregnancy | % Breakdown |
|------------------------------|-------------|
| Bleeding | 130 (43.8%) |
| Swelling of hands or feet | 64 (21.6%) |
| Headaches | 45 (15.2%) |
| Vulval sores | 16 (5.4%) |
| Decreased fetal movement | 75 (25.3%) |
| Urinary problems | 44 (14.8%) |
| Early contractions | 50 (16.8%) |
| Discharge of fluids | 41 (13.8%) |
| Other | 38 (12.8%) |
| Did not know | 37 (12.5%) |

Q43. When asked who tied and cut the cord at the child's delivery the following responses were obtained.

| Who tied the cord | % Breakdown |
|---------------------|-------------|
| Health professional | 215 (72.4%) |
| Family member | 55 (18.5%) |
| Other | 27 (9.1%) |

HIV/AIDS

Q44. 278 of the 297 mothers (93.6%) interviewed had heard of HIV/AIDS.

Q44.1 On the question of where knowledge of HIV/AIDS was acquired, the following was learned.

| Where was knowledge of HIV/AIDS acquired | % Breakdown |
|--|-------------|
| Radio | 146 (52.5%) |
| Clinics | 99 (35.6%) |
| Other media | 11 (4.0%) |
| Friends | 12 (4.3%) |
| Other | 10 (3.6%) |

Q45. In inquiring about mothers' knowledge of contracting HIV/AIDS transmission, the following results were recorded. The question read... "in which of the following ways can you contract HIV/AIDS"

| Question | Yes | Don't Know |
|-------------------|----------------|----------------|
| Kissing | 37.7% (112) | 15.9% (47) |
| Handshaking | 21.6% (64) | 20.6% (61) |
| Question (cont'd) | Yes (cont'd) | DK (cont'd) |

| | | |
|--------------------------|----------------|---------------|
| Toilet seat | 35.5% (105) | 16.2% (48) |
| Sexual intercourse | 93.2% (277) | 3.0% (9) |
| Sex with a condom | 8.4% (25) | 12.5% (37) |
| From mother to fetus | 87.2% (259) | 7.4% (22) |
| From breastmilk | 64.0% (190) | 22.2% (66) |
| From multiple partners | 93.3% (277) | 3.4% (10) |
| From husband | 87.5% (260) | 4.4% (13) |
| Eating with AIDS patient | 32.8% (98) | 16.9% (50) |
| From insect bites | 50.3% (149) | 24.7% (73) |
| Scarification | 78.6% (233) | 12.9% (38) |

The question included an opportunity for the respondent to enter her own ideas. The following is a summary of these other methods of contracting HIV/AIDS.

| Other | Frequency |
|---|-----------|
| Contact with sufferer's blood or body fluid/shared injections | 22 (7.4%) |
| Sharing utensils, clothing, bedding | 5 (1.7%) |
| Other | 4 (1.4%) |

Q46. Of the mothers interviewed, 170 (57.2%) felt they were personally at risk for HIV/AIDS and 58 (19.5%) didn't know.

Q47. When asked how mothers could protect themselves from the risk of aids the following was answered.

| Other | % Breakdown |
|------------------|-------------|
| Monogamy | 122 (42.2%) |
| Use a condom | 77 (27.3%) |
| Don't know | 56 (19.4%) |
| Abstain from sex | 2 (0.7%) |

Q48. 212 mothers (71.4%) believed HIV/AIDS was not curable and 64 (21.5%) did not know.

IV. DISCUSSION AND RECOMMENDATIONS

Age Distribution:

Of the mothers surveyed 5% were under eighteen and 13% were over 35. These age groups are at greater risk for complications during pregnancy and delivery, and will be a special target group for MCH interventions in the area. For example, they will receive special prenatal and delivery attention and will be targeted for family planning interventions.

Sixty-nine percent of the children in the survey were under one year of age. These data could be due to the fact that mothers with younger infants are more likely to be at home, whereas it is common for mothers with older infants to use creche services. Also, if the youngest children in the home were closely spaced (for example, if there were two children under two) it may have biased the survey results.

The project will seek to educate mothers regarding the importance of adequate child spacing (at least 2 years between pregnancies) and avoiding pregnancies for women under 18 or over 35.

Education/Occupation:

Thirty percent of the mothers interviewed could not read and of the 70% who could read, 29% could read only at the primary level. In order to reach all mothers, an inductive/participatory educational model including the presentation of poster designs, dramas, and songs will be used to educate mothers regarding preventative health practices. Time is available on the local radio station for communication of health messages. Community projects are currently implementing adult literacy programs and the project collaborates with these groups.

Sixty percent of the mothers leave their children with someone else when they are doing work outside the home. The majority of mothers leave their children with the grandmother or with an older sibling. Nine mothers mentioned leaving their child with their partners, neighbors or friends. Given these findings, the project will target grandmothers and older siblings along with mothers for health education activities, which will be conducted at churches and schools as well as in the villages.

Thirty six percent of mothers reported being involved in some type of income generating activity. Some common ones were: handicrafts, selling vegetables, selling prepared foods, and performing domestic work. Eight percent of the mothers had full time paying jobs. Mothers are limited in their ability to pay for health services or buy items such as fruits and vegetables. Other projects in the area are assisting mothers with income generation and the project will collaborate with these groups.

Breastfeeding/Nutrition:

The project will promote exclusive breastfeeding for the first 4 - 6 months of life and will instruct mothers to introduce foods between 4 and 6 months. Mothers will be encouraged to breastfeed their infants immediately after birth and to continue breastfeeding their child until 2 years of age.

Of the 65 children (0-4 months) 37% were being exclusively breastfed. Of the 67 children (5-8 months) 89.6% had been given solid or semi-solid foods. About 84% of mothers did not know that children should be introduced to foods other than breastmilk between four and six months of age; of these, 73.4% indicated an age for food introduction earlier than four months. This issue of the introduction of foods/fluids other than breastmilk will be a major focus of health education. The project will also emphasize the benefits of exclusive breastfeeding during the first four to six months of life by establishing consistent health education messages targeted at mothers, fathers, grandmothers, and TBAs in the project area.

According to the survey, 80% of mothers breastfed their child within the first eight hours after birth. The project will promote health education among WCBA and pregnant mothers which emphasizes the benefits of early initiation of breastfeeding and the use of colostrum. Health workers and TBAs will be trained in the delivery of these key health education messages.

Ten children (3.4%) in the survey had never been breastfed. At the time of the survey, 84.2% of the children were still being breastfed. Of the 23 children in the 20 - 23 month age group, 65.2% were still being breastfed. Mothers will be encouraged to continue breastfeeding up to 24 months of age. The project will convey health education messages which will reinforce the benefits of prolonged breastfeeding. TBAs and Health workers at all levels will be trained in the delivery of these messages which will be targeted towards WCBA, male partners and grandmothers.

To encourage early initiation and continuation of breastfeeding until 2 years of age health education should include the following messages which help mothers ensure a regular supply of breastmilk: breastfeed as soon as possible after birth; care for breasts/nipples; allow frequent sucking to stimulate production; breastfeed exclusively for the first four months of life; avoid bottle feeding; take in adequate food/fluid; and to attempt to relactate if she had stopped breastfeeding. Of these actions, 13.8% of mothers knew to care for breasts/nipples; 12.8% knew to allow frequent sucking to stimulate production; 11.1% knew to use the colostrum; 10.1% knew to exclusively breastfeed during the first few months; and 8.1% knew to avoid using a bottle. Six percent of the mothers mentioned eating well. Very few of the mothers mentioned relactation. Forty-four percent of the mothers did not know how to ensure a good supply of breastmilk. Given this current lack of knowledge among mothers in the project area, health education will be vital. TBAs and health workers at all levels will be used to bring this message both to mothers and the community as a whole.

It appears that over 60% of the mothers are giving their children foods enriched with calories, protein, vitamin A and iron. It is not clear from the survey, however, the quality and quantity of foods given to the children. The project will work with health care providers and community educators in establishing and promoting key messages related to infant feeding practices which encourage the provision of adequate foods of good nutritional value. Emphasis will also be placed on educating mothers regarding the need for additional nutritional food intake, both in terms of quality and quantity during the period when the child is recuperating from an illness.

Growth Monitoring:

Eighty-seven percent of the mothers in the survey had a growth monitoring card for their child. Eighty-four percent of those children had been weighed in the four months prior to the survey. The goal of the project will be to address the issue of the quality of the growth monitoring services being provided. Many of the cards observed had not been filled in properly or completely and the DOH staff state that very little nutrition counseling accompanies growth monitoring services. Health workers and community-based volunteers providing growth monitoring services will be trained in evaluating the direction of the growth curve and using methods for identifying appropriate nutritional education to mothers of children who are growth faltering or who are underweight.

In order to promote retention of the Road to Health cards, the project will train health workers at all levels in education messages to help mothers understand that the card is more than just a place to record vaccinations. A new card is now being introduced into the healthcare system and the project will help promote understanding of how the card is to be filled in and utilized.

Immunization:

Eighty seven percent of mothers had an immunization card for their child. Ninety-three percent said their child had received at least one immunization (verbal report).

For the 12 - 23 month group, antigen-specific immunization coverage rates based on information from the immunization card were as follows: BCG, 81.2%; DPT123, 57.4%; OPV123, 69.2% and Measles, 71.3%. The fully immunized coverage rate for children 12 - 23 months of age was 53.5% (includes BCG, DPT123, OPV123 and Measles). A 1990 vaccine survey completed for the KwaZulu/Natal Region recorded the following immunization coverage rates: DPT-3, 60%; OPV-3, 62%; and Measles, 56%. In comparison, the 1996 KPC Survey showed a slightly lower DPT-3 coverage rate than in 1990, but higher rates for Measles and OPV-3.

Project objectives are to increase DPT-1 coverage to 90% (Baseline, 75%) (represents access to vaccine services); increase Measles coverage to 90% (Baseline, 71%); and increase OPV-3 coverage to 80% (Baseline, 69%) (compliance). The overall goal of the project is for 80% full immunization coverage for children 12 - 23 months.

The survey revealed a difference of 25.5% between OPV-1 and OPV-3 and a difference of 17.8% for DPT-1 to DPT-3 in the 12 to 23 month group. Project objectives include: to reduce the drop-out rate, focus on health education regarding the immunization schedule and vaccine-preventable diseases; promote a policy whereby health workers take advantage of all opportunities to vaccinate children (reducing missed opportunities). Only 4.4% of the mothers knew that the measles vaccine should be administered at 9 months of age, so there is much need for greater understanding and education regarding the immunization schedule. The objective is for children to complete their immunization schedules before the end of the first year of life.

It was not possible to measure TT coverage among mothers since it is recorded on the antenatal card which is kept at the clinic. Thirty-two percent of the mothers interviewed knew that 2 doses of TT are needed before delivery to protect against neonatal tetanus. Presently, DOH policy is to only vaccinate pregnant women and not routinely vaccinate all WCBA. The project will promote health messages aimed at increasing the mother's knowledge regarding the need, purpose and number of TT injections required to prevent neonatal tetanus.

Diarrheal Diseases:

The key concern for children suffering from diarrhea is fluid loss and the resultant dehydration. The project will help establish key health messages and train health workers regarding the importance of increased fluids and continued feeding during the diarrheal episode and catch-up feeding after. Of the children included in the survey who had suffered from diarrhea in the two weeks prior to the survey, 58% were given more or the same amount of breastmilk during the diarrheal episode; 54% were given more or the same amount fluids; and 32% were given more or the same amount of food. Fifty percent of the mothers interviewed knew that a child recovering from diarrhea should receive additional food calories and nutrients. Community promoters and health workers at all levels will be trained to promote messages that emphasize the importance of additional fluids and continued feeding during diarrheal episodes.

Seventy-five percent of the mothers gave ORT to their children during the diarrhea episode. Nine percent of the mothers gave their children medicine for the treatment of diarrhea. Of the mothers who administered ORT, 40% gave sugar/salt solution; 30% used the ORS sachet to prepare ORT; and 4.7% gave cereal-based fluids. The project will promote health messages through health workers and community promoters for the administration of cereal-based ORT for children suffering from diarrhea and will discourage the practice of using medicines to treat diarrhea. ORS sachets will still be available at clinic sites and pharmacies.

When mothers were asked what signs would cause them to seek advice for their child suffering from diarrhea, 12.5% stated signs specifically related to diarrhea. Other signs and symptoms mentioned by mothers included, fever (31.6%), weakness or tiredness (25.6%), vomiting (19.5%), loss of appetite (28.6%) and blood in the stool (14.1%). UNICEF's Facts for Life messages state in order of priority the following symptoms as indicators for referral: dehydration, fever, loss of appetite, vomiting, passing several watery stools in one or two hours, and blood in the stool. The project will promote health messages stressing signs indicating the need for referral, both related to dehydration and other symptoms.

In terms of diarrhea prevention in relation to water and sanitation issues, the survey revealed that 68% of the households had a latrine or toilet facility. The majority of the mothers (56%) obtain their drinking water from a borehole, 18.6% from an unprotected spring, and 9.5% from a protected spring. The project will be involved with delivering health messages regarding the importance of clean drinking water and utilization of latrines, but will coordinate with other projects in the area to seek technical assistance in latrine construction and safe water supply.

Acute Respiratory Infection:

Thirty-six percent of the children in the survey sample had been ill with a cough or had difficulty breathing in the two week period prior to the survey. Eighty percent of these mothers whose children had been ill with a cough reported their child had rapid or difficult breathing and of this group, 85% sought medical treatment. The majority of these mothers (70%) sought treatment from a hospital or clinic, 20% sought treatment from a private doctor and 11% from traditional healers. Forty one percent of all mothers in the survey indicated that dyspnea would lead them to seek medical treatment for their child. Other symptoms which would lead them to seek assistance included: fever (24%), loss of appetite (19%), coughing (20%), and wheezing (18%). The project objective for ARI will be to provide training for health workers at all levels, including community promoters, in providing key messages that will help mothers promptly recognize and seek treatment for ARI. Training in a standard treatment protocol for ARI based on the WHO model will also be provided to health workers.

Maternal Care:

The South Africa MOH system does not use a maternal health card, so it was impossible to assess actual TT coverage for WCBA. The immunizations are recorded on the antenatal card which is kept at the clinic sites. Eighty one percent of the mothers had made three or more antenatal visits during their last pregnancy. Seventy eight percent of the mothers knew that they should see a health professional for an antenatal consult during the first trimester of their pregnancy. The mothers were also asked about high risk signs that would lead them to seek medical assistance. Forty-four percent of mothers said that bleeding would lead them to seek assistance; 25.3% said decreased fetal movements; 22% said swelling of the hands or feet; 15.2% said headaches; 16.3% said early contractions; 14.8% said urinary problems and 13.8% said discharge or fluids.

While the percentage of mothers attending prenatal consults is high, knowledge regarding high risk indicators is not as high. The project will focus on the quality of antenatal consults being provided, by improving health education messages about high risk signs and the need for prenatal care. The project will also work with the health care system to strengthen the referral system for high risk pregnancies.

Seventy-two percent of the deliveries were assisted by a health professional and 18.5% were assisted by a family member. The project plans to establish four additional rural health/community meeting centers in underserved areas to increase access to women who are not presently being assisted by health professionals for their prenatal and delivery care needs.

Eighty-three percent of the mothers interviewed did not want another child in the next two years or were not sure. Of these, 70% were using a modern form of contraception. The most common method of contraception was Depoprovera injections (71%) followed by oral contraceptives(17%). The project will focus on the quality of family planning services, specifically health education, in order to increase continued utilization rates and reduce the drop-out rate. Also given the number of young mothers encountered during the survey, efforts will be made to work with young WCBA to delay the age of their first pregnancy.

High Risk Signs vs Danger Signs

HIV/AIDS:

The project will include an HIV/AIDS intervention, as the rate of infection is extremely high in the KwaZulu/Natal Region. Ninety four percent of mothers interviewed said they had heard of HIV/AIDS. The majority said they had obtained their information from the radio (53%) or from the clinic(36%). Eighty-seven percent of mothers knew that HIV/AIDS can be transmitted through sexual intercourse with an infected individual; and 87.2% knew that HIV/AIDS can be passed from an infected mother to her fetus. Knowledge regarding transmission was fairly high, but the survey revealed that myths regarding HIV/AIDS transmission are also common. For example, some respondents mentioned kissing, shaking hands, sitting on toilet seats, and insects bites as possible ways to contract HIV/AIDS. Fifty-seven percent of mothers felt they were personally at risk for contracting HIV/AIDS. Forty two percent of the mothers believed they could protect themselves from AIDS by practicing monogamy and 27% stated by using a condom. Seventy one percent of the mothers knew that AIDS is not curable.

Project interventions will focus on reaching high risk groups for HIV/AIDS infection, especially those suffering with STDs. Education activities will also be directed at youth in the schools and will focus on relationship and communication skills as well as issues of sexuality. Education for WCBA and their male partners will also focus on relationship and communication skills so that individuals can learn how to negotiate safe sex or choose to abstain from sex if they so desire.

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Institute of Biostatistics, Medical Research Council, Durban.

University of Natal, Durban Dept. of Paediatrics and Child Health, and Center for Social and Devl. Studies.

APPENDICES

- A. Estimated Budget Costs for Baseline Survey**
- B. Map of Survey Area**
- C. Comparison of Proposed Project Objectives and Revised DIP Objectives.**
- D. Population Data**
- E. Questionnaires in Zulu and English**
- F. Random Cluster Sample Data**
- G. Schedule for Training of Supervisors and Interviewers**
- H. Justification of Survey Methodology**
 - "Cluster Sampling for Immunization Coverage", by Peter Kok
 - "Community-based Survey vs. Sentinel Site Sampling in determining the nutritional status of rural children", Solarsh, Sanders, Gibson, and Gouws

Appendix A

**BERGVILLE DISTRICT CHILD SURVIVAL PROJECT
KPC BASELINE SURVEY BUDGET**

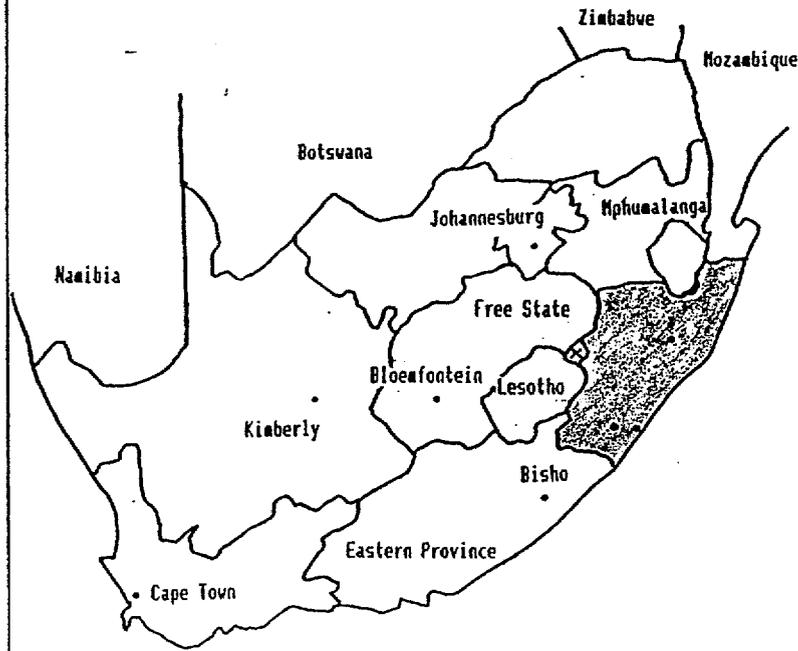
(22 January thru 3 February 1996)

| DESCRIPTION | AMOUNT US \$ |
|--------------------|---------------------|
| Meals/Refreshments | \$306 |
| Manpower | 3,994 |
| Vehicle Costs | 563 |
| Stationery | 388 |
| Utilities | 41 |
| TOTAL | \$5,292 |

MAP of the REPUBLIC OF SOUTH AFRICA

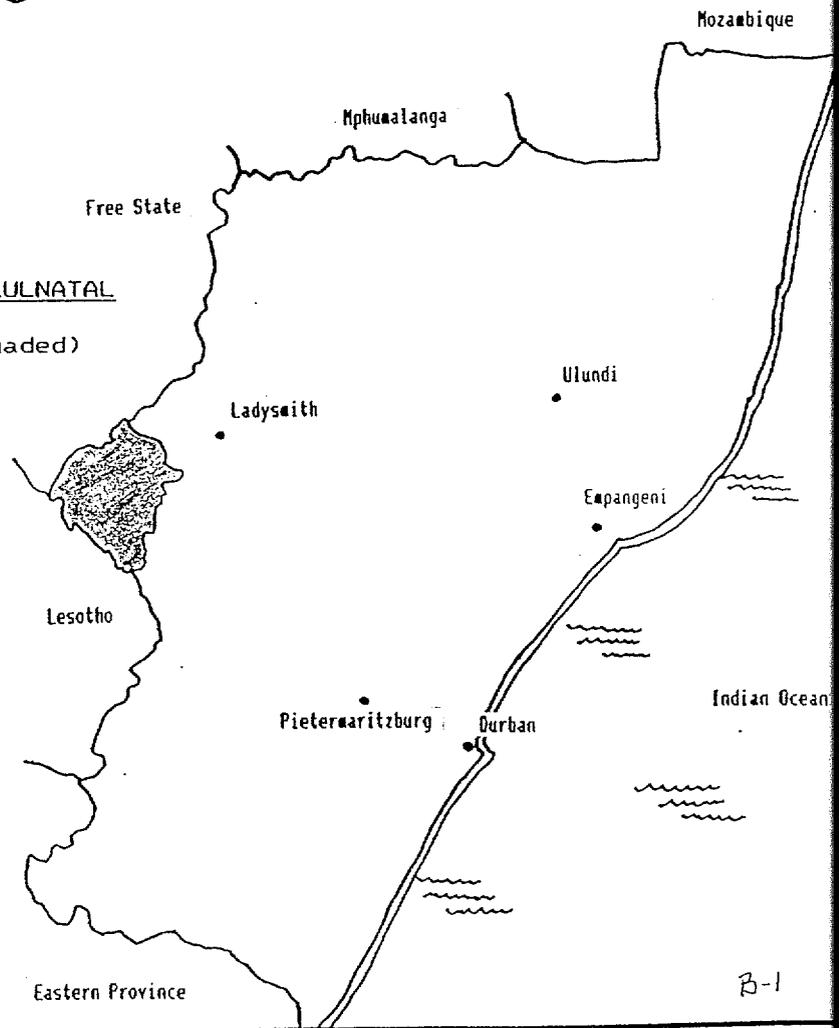
Appendix B

(KwaZuluNatal shaded and Bergville crossed)

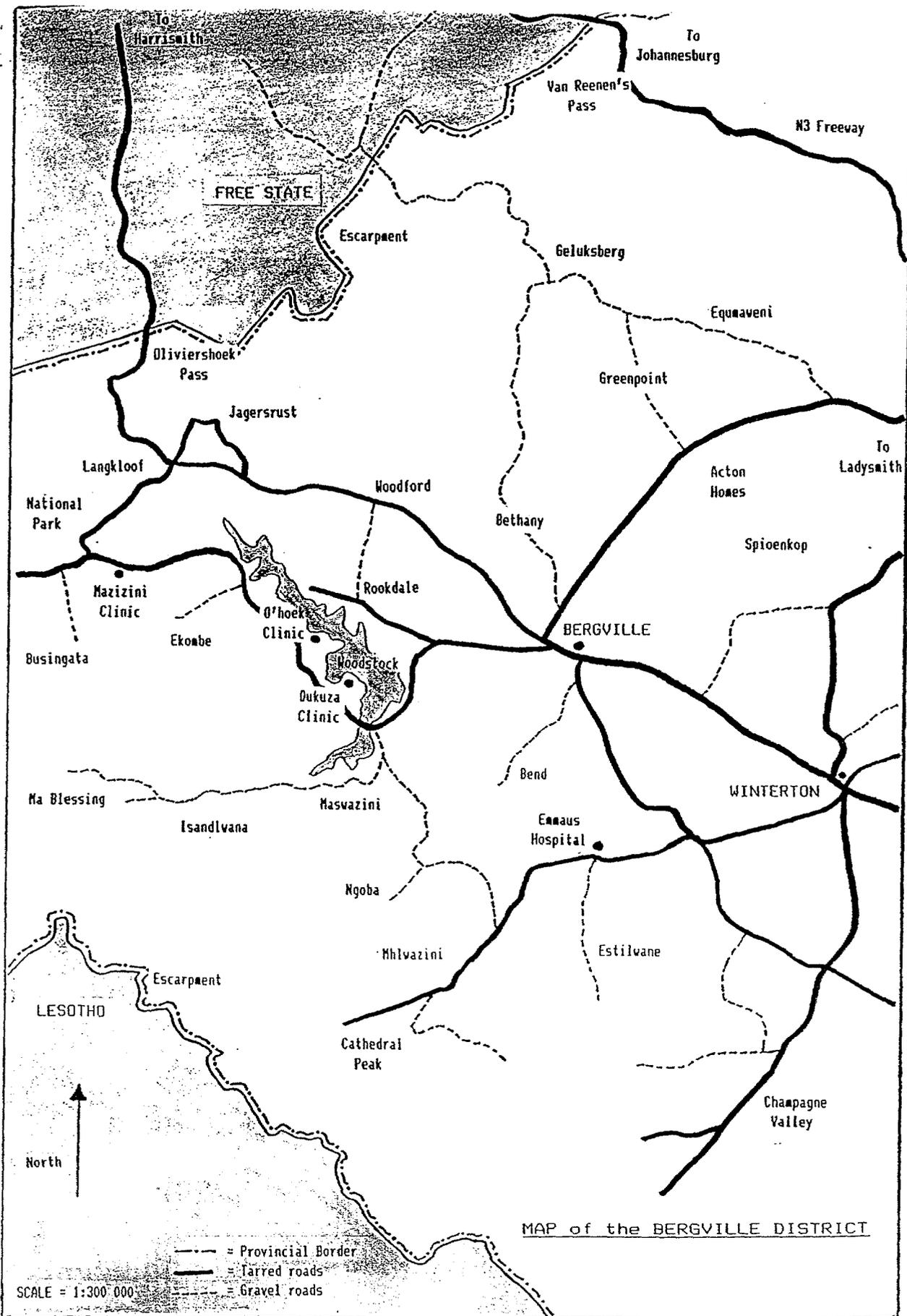


MAP of KWAZULULNATAL

(Bergville shaded)



B-1



MAP of the BERGVILLE DISTRICT

SCALE = 1:300 000

- - - - = Provincial Border
 ————— = Tarred roads
 - - - - - = Gravel roads

B-2

Appendix: C

Comparison of Proposed Project Objectives and Revised DIP Objectives

| Proposal Objectives | DIP Objectives |
|---|---|
| <p>1. 85% of infants (< 24 months) will be breastfed within 24 hours of birth.</p> <p>2. 30% increase in the number of infants (< 6 months) who are exclusively breastfed.</p> <p>3. 25% increase in the number of infants (5- 9 months) who are given solid or semi-solid foods.</p> <p>4. 60% of infants (20 - 24 months) are still breastfeeding and receiving solid or semi-solid food.</p> | <p>1. Increase to 65% the number of children (0-3 months) who are exclusively breastfeeding (Baseline, 50%.)</p> <p>2. 75% of children (20-23 months) will be breastfeeding (Baseline, 65%.)</p> <p>3. 80% of children (0-23 months) will have been weighed in the last 3 months.</p> |
| <p>5. 25% increase in infants/children (< 24 months) with diarrhea in the past two weeks whowere given the same or more breast milk.</p> <p>6. 25% increase in infants/children (< 24 months) with diarrhea in the past two weeks who were given the same or more fluids other than breastmilk.</p> <p>7. 25% increase in children (0- 24 months) with diarrhea in the past two weeks who were given the same amount or more food.</p> <p>8. 20% increase in infants/children (< 24 months) with diarrhea in the past two weeks who were treated with ORT.</p> | <p>4. Increase to 80% (Baseline, 60%) children (0-23 months) with diarrhea in the past 2 weeks who receive the same or more breast milk.</p> <p>5. Increase to 80% (Baseline, 55%) children (0-23 months) with diarrhea in the past two weeks who receive same amount or more fluid.</p> <p>6. Increase to 50% (Baseline, 32%) children (0-23 months) with diarrhea in the past two weeks who receive same amount or more food.</p> <p>7. Increase to 75% children (0-23 months) recovering from diarrhea who are given an extra nutritious meal/day (Baseline, 50%.)</p> |
| <p>9. 20% increase in the number of mothers who sought medical treatment for their children (< 24 months) with cough or rapid, difficult breathing in the past two weeks.</p> | <p>8. Maintain at 85% the number of mothers who sought medical treatment for children (< than 24 months) with cough and rapid breathing in past two weeks.</p> <p>9. Increase to 50% the number of mothers who know 2 or more referral signs for pneumonia.</p> |

| | |
|---|--|
| <p>10. 15% increase in the number of children (12 - 23 months) who received DPT-1.</p> <p>11. Increase to 80% the number of children (12 - 23 months) who have received OPV-3 (Baseline, 63%, 1990.)</p> <p>12. Increase to 90% the number of children (12 - 23 months) who have received measles vaccine (Baseline, 56%, 1990.)</p> <p>13. 20% reduction in the number of children (12 - 23 months) who defaulted between DPT-1 & DPT-3 doses.</p> <p>14. Maintain at 93% mothers with a maternal card for the birth of the youngest child (< 24 months.)</p> <p>15. 90% of mothers will have received two doses of tetanus toxoid vaccine before the birth of their youngest child (< 24 months.)</p> | <p>10. Increase to 90% the number of children (12 - 23 months) who receive DPT-1 (Baseline, 75%.)</p> <p>11. Increase to 80% the number of children (12 - 23 months) who receive OPV-3 (Baseline, 69%, 1996.)</p> <p>12. Increase to 90% the number of children (12 - 23 months) who receive measles vaccine (Baseline, 71%, 1996.)</p> <p>13. Reduce by 20% the number of children (12 - 23 months) who defaulted between DPT-1 and DPT-3 doses (96-5%; 97-10%; 98-15%; 99-20%) (Baseline, 24%.)</p> <p>14. Addition of 10 sentinel surveillance sites areas in hospital, farms and isolated communities.</p> |
| <p>16. Maintain at 93% number of mothers who had at least one antenatal visit (card) prior to the birth of their youngest child (< 24 months.)</p> | <p>15. 50% of pregnant mothers will know 2 or more danger signs for referral.</p> <p>16. 85% of mothers will have 3 or more antenatal visits.</p> <p>17. Strengthen referral systems in 4 outlying areas by establishing rural health/community meeting centers.</p> <p>18. Increase awareness, implementation and documentation on antenatal cards of high risk protocols.</p> <p>19. Mothers to retain maternal and Road to Health cards.</p> |
| <p>17. Increase by 20% the number of mothers of children (< 24 months) who desire no more children in the next two years or are not sure, who are using a modern contraceptive method.</p> | <p>20. Increase to 80% the number of mothers of children (< 24 months) who desire no more children in the next 2 years or are not sure, who are using a modern contraceptive method (Baseline, 70%.)</p> |

Appendix D

POPULATION DATA

SIZE OF POTENTIAL BENEFICIARY POPULATION

| Population Age Group | Number of Beneficiaries |
|---|-------------------------|
| Infants (0 - 11 months) | 5,500 |
| Children (12 - 23 months) | 5,000 |
| Children (24 - 59 months) | 8,500 |
| Children and Adolescents (5 - 19 years) | 40,000 |
| Females (15 - 49 years) | 30,000 |
| Total Beneficiaries | 89,000 |

Estimated total population for the Bergville District and the Project Area is 130,000.

Appendix E

CLUSTER # _____

HOUSEHOLD # _____

RECORD# _____

ALL QUESTIONS ARE TO BE ADDRESSED TO THE MOTHER WITH A CHILD LESS THAN 24 MONTHS OF AGE

Interview date
____/____/9__ (dd/mm/yy)
Reschedule interview
____/____/9__ (dd/mm/yy)

Interviewer _____
Community _____
Supervisor _____

BEGIN WITH INTRODUCTION AND CONSENT FORM

1. Name and age of the mother

Name _____
Age (years) _____

1.1 Name and age of caregiver (if not the mother) and his/her relationship to the mother.

Name _____
Age (years) _____
Relationship _____

2. Name and age of the child less than 24 months of age

Name _____
Birth date ____/____/____ (dd/mm/yy)
Age in months _____

Mother's Education/Occupation

3. What is the highest level of education passed?

- a. none []
- b. primary does not read..... []
- c. primary reads..... []
- d. secondary & high school or above..... []
- e. matric.and above..... []

4. Do you do any "income generating work"?
(multiple answers possible; record all answers)

- a. no..... []
- b. yes..... []

4.1 If yes, what work are you doing?

- a. hawker..... []
- b. handicraft, weaving, rugs, et..... []
- c. Amathogo (temporary work)..... []
- d. selling own vegetables or own foods..... []
- e. domestic work for others (part - time)..... []
- f. shop keeper..... []
- g. salaried worker (regular salary)..... []
- h. government maintenance..... []
- i. disability pension for the mother..... []
- j. other (specify) _____ []

5. Who takes care of (name of child) while you are away from home? (multiple answers possible; record each one)

- a. mother takes child with her..... []
- b. gogo (grandmother)..... []
- c. older children..... []
- d. maid / nanny..... []
- e. creche..... []
- f. neighbor/friends..... []
- g. husband/partner..... []

- h. other..... []
- i. relatives..... []

Breastfeeding/Nutrition

6. Are you breastfeeding (name of child)?

- a. yes.....(go to 8) []
- b. no..... []

7. Have you ever breast-fed (name of child)?

- a. yes..... []
- b. no..... (go to 9) []

8. After the delivery, when did you breast-feed (name of child) for the first time?

- a. during the first hour after delivery..... []
- b. from 1 to 8 hours after delivery..... []
- c. more than 8 hours after delivery..... []
- d. do not remember..... []

9. What kinds of foods are you giving (name of child)?

- 9.1 Are you giving (name of child) cow's milk, goat's milk or formula?
- a. yes..... []
 - b. no..... []

9.2 Are you giving (name of child) soft foods such as porridge?

- a. yes..... []
- b. no..... []

9.3 Are you giving (name of child) water or tea to drink?

- a. yes..... []
- b. no..... []

9.4 Are you giving (name of child) fruits?

- a. yes..... []
- b. no..... []

9.5 Are you giving (name of child) carrot, or pumpkin?

- a. yes..... []
- b. no..... []

9.6 Are you giving (name of child) dark green leafy vegetables, such as spinach, pumpkin leaves or wild spinach?

- a. yes..... []
- b. no..... []

9.7 Are you giving (name of child) meat, chicken or fish?

- a. yes..... []
- b. no..... []

9.8. Are you giving (name of child) peanuts, soya, peanut butter or beans?

- a. yes..... []
- b. no..... []

- 9.9 Are you giving (name of child) eggs or maas? []
 a. yes..... []
 b. no..... []
- 9.10 Are you adding sugar to (name of child)'s meals? []
 a. yes..... []
 b. no..... []
- 9.11 Are you adding holsum, rama, peanut butter or oil to (name of child)'s meals? []
 a. yes..... []
 b. no..... []
- 9.12 Are you adding iodized salt to (name of child)'s meals? []
 a. yes..... []
 b. no..... []
 c. doesn't know..... []
- 9.13 Are you adding dark green leafy vegetables, such as spinach, to (name of child)'s food? []
 a. yes..... []
 b. no..... []

10. What can a mother do in the baby's first four months of life to keep on breastfeeding? (multiple answers possible; record all answers)

- a. doesn't know..... []
 b. breastfeed as soon as possible after delivery (don't discard colostrum)... []
 c. care of breasts, nipples..... []
 d. frequent suckling to stimulate production..... []
 e. exclusive breastfeeding during the first four months..... []
 f. avoid bottle feeding of baby..... []
 g. relactation (if had to stop, mother can resume breastfeeding again)... []
 h. take extra fluid..... []
 i. depprovera (injection)..... []
 j. other (specify)..... []

11. When should a mother start adding foods to breastfeeding?

- a. start adding earlier than 4 months of age..... []
 b. start adding between 4-6 months of age..... []
 c. start adding about 6 months of age..... []
 d. start adding later than 6 months of age..... []
 e. doesn't know..... []

Immunizations

12. Has (name of child) ever received any immunizations?

- a. yes..... []
 b. no..... []
 c. doesn't know..... []

Growth Monitoring

13. Does (name of child) have a Road to Health card?

- a. yes..... (must see card) []
 b. no..... (go to 16) []
 c. lost card..... (go to 16) []

14. Look at the growth monitoring card of the child, and record the following information: has the child been weighed in the last four months?

- a. yes..... []
 b. no..... []

15. Look at the vaccination card and record the dates of all the immunizations in the space below (dd /mm / yy):

| | | | | | | |
|-------|----------|-----------------|--------|-------------------|-----|-----------------|
| BCG | 1st | ___ / ___ / ___ | | | | |
| | 2nd | ___ / ___ / ___ | | | | |
| | BCG scar | Yes [] | No [] | (Check both arms) | | |
| POLIO | 1st | ___ / ___ / ___ | | HBV | 1st | ___ / ___ / ___ |
| | 2nd | ___ / ___ / ___ | | | 2nd | ___ / ___ / ___ |
| | 3rd | ___ / ___ / ___ | | | 3rd | ___ / ___ / ___ |
| | 4th | ___ / ___ / ___ | | | | |
| DPT | 1st | ___ / ___ / ___ | | Measles | 1st | ___ / ___ / ___ |
| | 2nd | ___ / ___ / ___ | | | 2nd | ___ / ___ / ___ |
| | 3rd | ___ / ___ / ___ | | | | |
| | 4th | ___ / ___ / ___ | | | | |

16. At what age should (name of child) receive the first measles vaccine?
 a. specify in months..... [___ / ___]
 b. doesn't know..... []
17. Can you tell me the main reason why pregnant women need to be vaccinated with tetanus toxoid vaccine?
 a. to protect both mother/newborn against tetanus..... []
 b. to protect only the woman against tetanus..... []
 c. to protect only the newborn against tetanus..... []
 d. doesn't know..... []
 e. other..... []
18. How many tetanus toxoid injections does a pregnant woman need to protect the newborn infant from tetanus?
 a. one..... []
 b. two..... []
 c. more than two..... []
 d. none..... []
 e. doesn't know..... []

Diarrheal Diseases

19. Has (name of child) had diarrhea (three watery stools in a day & night) during the last two weeks?
 a. yes..... []
 b. no..... (go to 26) []
 c. doesn't know..... (go to 26) []
20. During (name of child)'s diarrhea did you breast-feed (READ choices 1-5 to the mother)
 a. more than usual?..... []
 b. same as usual?..... []
 c. less than usual?..... []
 d. stopped completely..... []
 e. child not breastfed..... []
21. During (name of child)'s diarrhea, did you provide (name of child) with fluids other than breast-milk? (READ choices 1-5 to the mother)
 a. more than usual?..... []
 b. same as usual?..... []
 c. less than usual?..... []
 d. stopped completely?..... []
 e. exclusively breastfeeding?..... []

22. During (name of child)'s diarrhea, did you continue to provide (name of child) with solid/semisolid foods? (READ choices 1-5 to the mother)

- a. more than usual?..... []
- b. same as usual?..... []
- c. less than usual?..... []
- d. stopped completely?..... []
- e. exclusively breastfeeding?..... []

23. When (name of child) had diarrhea, what treatments, if any, was given?
(multiple answers possible; record all answers)

- a. nothing..... []
- b. ORS sachet (eg. SOROL) (from the clinic)..... []
- c. sugar-salt solution (home prepared)..... []
 - d. rice, liquid porridge or Oral rehydration treatment..... []
 - e. other home available fluids, i.e. tea..... []
 - f. anti-diarrhea medicine or from chemist..... []
 - g. herbal medicines or enemas..... []
 - h. castor oil..... []
 - i. other specify..... []

24. When (name of child) had diarrhea, did you seek advice or treatment for the diarrhea?

- a. yes..... []
- b. no..... (go to 26) []

25. From whom did you seek advice or treatment for the diarrhea of (name of child)?
(multiple answers possible; record each answer)

- a. hospital..... []
- b. health center/clinic/mobile clinic..... []
- c. private doctor..... []
- d. pharmacy (chemist)..... []
- e. community health worker..... []
- f. Isangoma (witch doctor)..... []
- g. Inyanga (herbalist)..... []
- h. Umthandazo (faith healer)..... []
- i. Ukhiphainyoni (removing the bird)..... []
- j. gogo (grandmother)..... []
- k. relatives & friends..... []
- l. other (specify)..... []

26. What signs/symptoms would cause you to seek advice or treatment for (name of the child)'s diarrhea? (multiple answers possible; record all answers) do not read answers.

- a. doesn't know..... []
- b. vomiting..... []
- c. fever..... []
- d. dry mouth, sunken eyes, sunken fontanelle, decreased urine output (dehydration)..... []
- e. diarrhea of prolonged duration (at least 14 days)..... []
- f. blood and/or mucous in stool..... []
- g. loss of appetite..... []
- h. weakness or tiredness..... []
- i. other (specify)..... []

27. What are important actions you should take if (name of child) has diarrhea?
(multiple answers possible; record all answers) do not read answers.

- a. doesn't know..... []
- b. initiate fluids rapidly..... []
- c. give the child more to drink than usual..... []
- d. give the child smaller more frequent feeds..... []
- e. proper mixing and administration of Oral rehydration solution..... []

27. (continued)
- f. take child to the hospital/health clinic.....[]
 - g. feed more after diarrhea episode so that child can re-gain weight.....[]
 - h. withhold fluids.....[]
 - i. withhold foods.....[]
 - j. other (specify) _____[]
28. What are important actions a mother should take when a child is recovering from diarrhea? (multiple answers possible; record all answers)
- a. doesn't know.....[]
 - b. give the child smaller more frequent feeds.....[]
 - c. other (specify) _____[]
29. Do you have a toilet at home ?
- a. yes.....[]
 - b. no.....[]
30. Where do you collect your water from?
- a. borehole.....[]
 - b. river.....[]
 - c. dam.....[]
 - d. protected spring.....[]
 - e. unprotected spring.....[]
 - f. Rain water.....[]
 - g. other (specify) _____[]

Respiratory Illness

31. Has (name of child) been ill with cough or difficult breathing in the last two weeks?
- a. yes.....[]
 - b. no.....(go to 35)[]
32. Did (name of child) experience rapid (fast) and difficult breathing (dyspnea) when ill?
- a. yes.....[]
 - b. no(go to 35)[]
 - c. doesn't know.....(go to 35)[]
33. Did you seek treatment when (name of child) was ill with these respiratory problems?
- a. yes.....[]
 - b. no(go to 35)[]
34. From whom did you seek treatment for (name of child) when ill with rapid and difficult breathing? (multiple answers possible; record all answers)
- a. hospital.....[]
 - b. health center/clinic/mobile clinic.....[]
 - c. private doctor.....[]
 - d. community health worker.....[]
 - e. Isangoma (witchdoctor).....[]
 - f. Inyanga (herbalist).....[]
 - g. Ukiphathambo (traditional chest specialist).....[]
 - h. Umthandazo (faith healer).....[]
 - i. gogo (grandmother).....[]
 - j. relatives & friends.....[]
 - k. other (specify).....[]

35. What are the signs/symptoms of respiratory infection that would cause you to take (name of child) to a health facility? (Multiple answers possible; record all answers) do not read answers.)

- a. doesn't know..... []
- b. fast or difficult breathing..... []
- c. chest indrawing..... []
- d. loss of appetite..... []
- e. fever..... []
- f. cough..... []
- g. groaning..... []
- h. wheezing or noisy breathing..... []
- i. other (specify) _____ []

MATERNAL CARE

36. How many ante-natal visits did you have during your last pregnancy?

- a. one..... []
- b. two..... []
- c. three or more..... []
- d. none..... []
- e. does not remember..... []

37. Are you pregnant now?

- a. yes..... (go to 41) []
- b. no..... []
- c. doesn't know..... []

38. Do you want to have another child in the next two years?

- a. yes..... (go to 41) []
- b. no..... []
- c. doesn't know..... []

39. Are you or your husband/partner currently using any method to avoid/postpone getting pregnant?

- a. yes..... []
- b. no..... (go to 41) []

40. What is the main method you or your husband/partner are using now to avoid / postpone getting pregnant?

- a. tubal ligation or vasectomy..... []
- b. injections..... []
- c. pill..... []
- d. IUCD (loop)..... []
- e. condom..... []
- f. lactational amenorrhea method (exclusive breast-feeding)..... []
- g. rhythm / natural method..... []
- h. abstinence..... []
- i. coitus interruptus/withdrawal..... []
- j. ukusoma (external sex)..... []
- k. cord around the waist..... []
- l. other(specify)..... []

41. When should a pregnant woman first see a health professional (doctor, nurse, midwife) (PROBE FOR MONTHS)

- a. first trimester, 1-3 months..... []
- b. middle of pregnancy, 4-6 months..... []
- c. last trimester, 7-9 months..... []
- d. no need to see health worker..... []
- e. doesn't know..... []

42. What are the danger signs that would cause you to go to the clinic or hospital, during pregnancy? Multiple answers possible; Record all answers

- a. spotting with blood or bleeding..... []
- b. swelling hands & face..... []
- c. headaches..... []
- d. vulval sores or discharge..... []
- e. decreased fetal movement..... []
- f. urine problems..... []
- g. early contractions..... []
- h. previous caesarian section or abortion..... []
- i. discharge of any fluid other than urine (ruptured membrane)..... []
- j. other (specify)..... []

43. At the delivery of (name of child), who tied and cut the cord?

- a. yourself..... []
- b. family member..... []
- c. traditional birth attendant..... []
- d. hospital midwife/ doctor..... []
- e. clinic midwife/doctor..... []
- f. other (specify) _____ []
- g. doesn't know..... []

HIV/AIDS

44. Have you heard of HIV/AIDS?

- a. Yes..... []
- b. No..... []
- c. doesn't know..... []

44.1 If yes, from where and/or whom _____

45. In which of the following ways can you contract HIV/AIDS ?

(READ OUT CHOICES, MULTIPLE ANSWERS POSSIBLE)

- a. Kissing
 - i. yes..... []
 - ii. no..... []
 - iii. doesn't know..... []
- b. Handshaking
 - i. yes..... []
 - ii. no..... []
 - iii. doesn't know..... []
- c. From a toilet seat
 - i. yes..... []
 - ii. no..... []
 - iii. doesn't know..... []
- d. Sexual intercourse
 - i. yes..... []
 - ii. no..... []
 - iii. doesn't know..... []
- e. Sexual intercourse without a condom
 - i. yes..... []
 - ii. no..... []
 - iii. doesn't know..... []
- f. From pregnant mothers to unborn children
 - i. yes..... []
 - ii. no..... []
 - iii. doesn't know..... []
- g. Breastmilk
 - i. yes..... []
 - ii. no..... []
 - iii. doesn't know..... []

- h. Multiple partners
 - i. yes..... []
 - ii. no..... []
 - iii. doesn't know..... []
- i. From your husband
 - i. yes..... []
 - ii. no..... []
 - iii. doesn't know..... []
- j. Eating together
 - i. yes..... []
 - ii. no..... []
 - iii. doesn't know..... []
- k. Insects
 - i. yes..... []
 - ii. no..... []
 - iii. doesn't know..... []
- l. Scarification
 - i. yes..... []
 - ii. no..... []
 - iii. doesn't know..... []
- m. Other specify _____ []

46. Do you think that you personally can get HIV/AIDS ?
- a. yes..... []
 - b. no..... []
 - c. doesn't know..... []

47. What can you do to protect yourself from getting HIV/AIDS?

48. Do you think HIV/AIDS can be cured ?
- a. yes..... []
 - b. no..... []
 - c. doesn't know..... []

49. List the organizations that are in your community. (Do not read answers)
- a. church..... []
 - b. savings club..... []
 - c. burial society..... []
 - d. women's group..... []
 - e. development committee..... []
 - f. other (specify) _____ []
 - g. doesn't know..... []

50. Who are the important leaders in your community? (Do not read answers)
- a. headman..... []
 - b. pastor..... []
 - c. principal..... []
 - d. chief..... []
 - e. other (specify) _____ []
 - f. doesn't know..... []

**** END OF QUESTIONNAIRE ****

IQQO O _____ IKHAYA NO. _____ USHCILELO _____

YONKE IMIBUZO KUMELE IBHEKISWE KUMAMA ONENGANE ENGAPHANSI KWEMINYAKA EMIBILI IZELWE. 24 WEZINYANGA NANGAPHANSI.

Usuku lwemibuzo _____
Usuku oluhlelwe kabusha _____

obuzayo _____
Umphakathi _____
Umqaphi _____

1. Igama neminyaka yobudala kamama.

igama _____
Iminyaka _____

1.1 Igama neminyaka yobudala bomntwana uma kungesiye umama, nobudlelwane, ubuhlobo bakhe kumntwana.

igama _____
Iminyaka _____
Ubudlelwane _____

2. Igama nobudala bomntwana ongengaphezulu kweminyaka emibili 24 wezinyanga.

igama _____
Usuku lokuzalwa _____
Ubudala _____

3. Wacina kuliphi ibanga esikoleni:

- a. angifundanga..... []
- b. eprimary angikwazi ukufunda..... []
- c. eprimary ngingafunda..... []
- d. esecondary/ e-high school..... []
- e. ngqeda umatikuletsheeni noma ngaphezulu..... []

4. Kulona yini umsebenzi owenzayo oenzisa imali? (zimpendulo ezisihle zingaveza zikhulu zenke)

- 4.1 yebo..... []
- 4.2 ayi..... []

Uma uthe yebo imuphi umsebenzi owenzayo?

- a. umdayisi..... []
- b. umsebenzi wezandla, obhasikidi, omata..... []
- c. ngiyatohoza..... []
- d. ngithengisa ngezilimo zami noma ukudla..... []
- e. ngisebenza ekhaya lomuntu..... []
- f. ngingumgqini sitolo..... []
- g. ngisebenza imisebenzi ngokubona ngeminyaka..... []
- h. ngisebenza ngokufunda..... []
- i. ngisebenza ngokufunda..... []
- j. ngisebenza ngokufunda..... []

5. Ubani obheka(igama lengane) uma wena ungekho ekhaya? (izimpendulo zingavela, zibhale zonke)
- a. umama uthi uhamba nomntwana.....[]
 - b. ugoto wakhe.....[]
 - c. izingane ezindadlana.....[]
 - d. umngane wakhe.....[]
 - e. ngimushiya enkulisa.....[]
 - f. omakhelwane / abangane.....[]
 - g. umyeni wami / isoka lami.....[]
 - h. ezinye izihlobo.....[]

Ukuncelisa/Nokudla

6. Uyamncelisa (igama lengane)?
- a. yebo.....[]
yeqela kunamba-8
 - b. cha.....[]

7. Wake wamncelisa (igama lengane)?
- a. yebo.....[]
 - b. cha.....[]
yeqela kunamba-9

8. Uma kuzibeletha waqala nini ukuncelisa igama lengane?
- a. ngehora elilodwa ezelwe.....[]
 - b. kusukela ehoreni elilodwa kuya kwangu-8 ngitetile.....[]
 - c. kweqa amahora angu-8 ngitetile.....[]
 - d. angisakhumbuli.....[]

9. 9.1 Uyamupha ubisi lwenkomo noma lwembuzi noma lokuthengwa (igama lengane)?
- a. yebo.....[]
 - b. cha.....[]
- 9.2 Uyaqha igama lwenkomo noma lwembuzi noma lokuthengwa ngama-ama-ndi noma imaze ngani?
- a. yebo.....[]
 - b. cha.....[]

- 9.3 Uyamupha (igama lengane) amanzi noma itiye aphuze?
- a. yebo.....[]
 - b. cha.....[]

- 9.4. Uyamupha (igama lengane) izithelo?
- a. yebo.....[]
 - b. cha.....[]

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9.5. Uyamupha (igama lengane) iziqathi noma ithanga?
a. yebo..... []
b. cha..... []

9.6. Uyamupha (igama lomntwana) izitshalo ezingamacembe njenge sipinashi imifino, noma okunye?
a. yebo..... []
b. cha..... []

9.7. Uyamupha (igama lomntwana) inyambo, inkukhu, noma inhlanzi?
a. yebo..... []
b. cha..... []

9.8. Uyamupha (igama lomntwana) amantongomane, imana, ibhotela lama-
ntongomane noma ubhontshisi?
a. yebo..... []
b. cha..... []

9.9. Uyamupha (igama lomntwana) amaqanda noma amasi?
a. yebo..... []
b. cha..... []

9.10. Uyawuthela yini ushukela ekudleni kuka-(igama lomntwana)?
a. yebo..... []
b. cha..... []

9.11. Uyamufakela amafutha e-hoisum, itanga, ibhotela lamantongomane
noma ngowoyela ekudleni (igama lomntwana)?
a. yebo..... []
b. cha..... []

9.12. Uyaziaka itswayi eline-iodine ekudleni kuka-(igama lomntwana)?
a. yebo..... []
b. cha..... []
c. angazi..... []

9.13. Uyamufakela yini (igama lomntwana, izitshalo ezingamacembe, noma
aluhlaza njengesipinashi) ekudleni kwakhe?
a. yebo..... []
b. cha..... []

10. Unama angenzanjani ukuze aqhubeke nokuncelisa umntwana ibele
ibinyanga ezine zokuqala ezeiwe? (ungathola izimpendulo eziningi
kuzo vele izimpendulo)
a. aqazi..... []
b. ukuncelisa masingane ibele enye kuzo vele izimpendulo
eziningi..... []

- c. ukunakekela amabele nezingono.....[]
- d. ukumfaka ebeleni khashanakhashana ukuze ubisi luze ngamandla.....[]
- e. ukumupha ibele loywa izinyanga ezine zokuqala ezeiwe.....[]
- f. ukungamuphi ibhodlela umntwana.....[]
- g. ukuphinde umuphe ibele uma kudingekile ukumhi aliyekiswe
aphinde aliqaliswe futhi).....[]
- h. ukumphuzisa okusamanzi kakhulu.....[]
- i. umjovo idepo.....[]
- j. okunye (kuchaze).....[]

11. Kufanele sçate nini umama ukwengeza ukucio sobe emuphis ibele umntwana?

- a. ukwengeza ngaphambi kwezinyanga ezine zobudala.....[]
- b. ukuqala ukwengeza phakathi kwezinyanga ezine neziyisithupha zobudala.....[]
- c. ukwengeza ezinyangeni cishe eziyisithupha ezelwe.....[]
- d. ukwengeza emuva kwezinyanga eziyisithupha ezelwe.....[]
- e. akazi.....[]

12. Utni yena uke wagoma?

- a. yebo.....[]
- b. cha.....[]
- c. angazi.....[]

13. U-igama (omntwana) -nalo yini ikhadi lasekininini lokuqonda nokukalala?

- a. yebo.....[]
- b. cha.....[]
- c. lajabeka.....[]

14. Bheka ikhadi lomntwana bese ubnala lolulwazi. Ike yakalwa yini lagene ezinyangeni ezine ezedlule?

15. Ukuqala ukwengeza ibele (bheka izingato zombini)

isigomo wofuba 1st.....[]
 2nd.....[]
 isibazi somgomo wofuba yebo.....[]
 cha.....[]
 (bheka izingato zombini)

ivendle 1st.....[] isifo sesibindi 1st.....[]
 POLIO 2nd.....[] BV 2nd.....[]
 3rd.....[] 4th.....[]

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YUNIBESITHI YAMAMBO

owozagiga noqhoqhoqho nomhlathinqi 1st...../...../.....

DPT

2nd...../...../.....

3rd...../...../.....

4th...../...../.....

owesimungumungwane 1st...../...../.....

MISASLES

2nd...../...../.....

16. Usuke esengakanani umntwana lapho ethola khona umgomo wesimungumungwane (okokugala)?

- a. shono ngezinyanga..... [/]
- b. angazi..... []

17. Ungangisheki isizathu esisemqoka sokuba umama agomele umhlathini ngqi ngesikhathi ekhulelwe?

- a. ukuvikelela umama nomntwana esifweni sika-mhlathinqi..... []
- b. ukuvikelela umama kuphela kumhlathinqi..... []
- c. ukuvikelela umntwana uma esezelwe kumhlathinqi..... []
- d. angazi..... []
- e. okunye (kuchazi)..... []

18. Mangazi angabizwa ngokuhlathinqqi okumele umama ayithole kule umntwana ozazalelwa ngaye kumhlathinqqi?

- a. ayikho..... []
- b. ayikho ngaphandle..... []
- c. ayikho ngaphakathi..... []
- d. ayikho..... []
- e. akazi..... []

Isifo sokugo

19. U-umntwana othile uqhekeka kakhulu xa kusolwa ngokungabizwa ngokuhlathinqqi okumele umama ayithole kule umntwana ozazalelwa ngaye kumhlathinqqi? Njengani?

- a. ayikho..... []
- b. ayikho ngaphandle..... []
- c. ayikho ngaphakathi..... []
- d. ayikho..... []
- e. akazi..... []

20. Ngesikhathi yena enesifo sokugo wawumngqiso? WFUNYISELE

ZONKE IZIMPINDULO: UMGAMA 1-5

- a. kakho kancinane..... []
- b. ngenxa..... []
- c. kancinane..... []
- d. ngokungabizwa ngokuhlathinqqi okumele umama ayithole kule umntwana ozazalelwa ngaye kumhlathinqqi..... []
- e. akazi..... []

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ngaphandle kobisi lwebele? (IMFUNDELE ZONKE IZIMPENDULO UMAMA)

- a. kakhulu kunokwejwayelekile.....[]
- b. njengokwejwayelekile.....[]
- c. kancane kunokwejwayelekile.....[]
- d. ngamvekisa ibele.....[]
- e. ngamncelisa ibele lodwa.....[]

22. Ngesikhathi yena enesifo sohudo waqhubeka yini nokumfunza ukudla okuqinile noma okuthambile? (IMFUNDELE ZONKE IZIMPENDULO UMAMA)

- a. kakhulu kunokwejwayelekile.....[]
- b. njengokwejwayelekile.....[]
- c. kancane kunokwejwayelekile.....[]
- d. ngamvekisa ibele.....[]
- e. ngamncelisa ibele lodwa.....[]

23. Ngesikhathi yena ehanjiswa isisu wamelapha ngani uma wamelapha? (ziningi izimpendulo ezingashiwo, zibhale zonke)

- a. ruho.....[]
- b. ingxubelelo lapho ana namanzi noshukela (inpushana fena nenyithe a nochompilo).....[]
- c. ingxubelelo lapho ana namanzi nosawoti (oyenza ekhaya).....[]
- d. kakhulu noma ngaphandle.....[]
- e. okubizwayo okinjalo kukhona nje ekhaya, isib: itiyi.....[]
- f. umbu otyeni sakhona noma umuthi engawutnolo ekhemisi.....[]
- g. umbu namalimbabi noma ngamnatra.....[]
- h. ucasta eli.....[]
- i. nokunye (kuchazi).....[]

24. Ngesikhathi yena enesifo sohudo waya yini ukofuna usizo ngalesifo sabhe?

- a. ngaphandle kobisi lwebele.....[]
- b. ngaphandle kobisi lwebele ngokwejwayelekile.....[]
- c. ngaphandle kobisi lwebele ngokwejwayelekile ngokwejwayelekile.....[]
- d. ngaphandle kobisi lwebele ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile.....[]
- e. ngaphandle kobisi lwebele ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile.....[]
- f. ngaphandle kobisi lwebele ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile.....[]
- g. ngaphandle kobisi lwebele ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile.....[]
- h. ngaphandle kobisi lwebele ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile.....[]
- i. ngaphandle kobisi lwebele ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile.....[]
- j. ngaphandle kobisi lwebele ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile.....[]
- k. ngaphandle kobisi lwebele ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile ngokwejwayelekile.....[]
- l. ngaphandle kobisi lwebele ngokwejwayelekile ngokwejwayelekile.....[]

- k. ezihlotsheni nakubangani.....[]
 l. nokunye (kuchaze).....[]

26. Zimpawu zini engathi uma uzibona zenzeka kumntanakho ubusuyofuna usizo noma ukwelapha uma ehuda? (ziningi izimpendulo ezingashiwo zibhale zonke)

- a. angazi.....[]
 b. ukuhlanza.....[]
 c. ukushisa kakhulu.....[]
 d. umlomo owomile, ukushona kwamehlo phakathi, ukushona kokhakhayi phakathi, ukuncipha komchamo awuchamayo.....[]
 e. ukukhishwa isisu isikhathi eside (okungenani izinsuku ezi-14.....[]
 f. igazi noma amatheketheke endleni yakhe.....[]
 g. uma engakuthandi ukudla.....[]
 h. uma ebonakala ekhathele noma umzimba untekenteke.....[]
 i. nokunye (chaza).....[]

27. Zinyathelo zini ezisemqoka okumele uzithathe umayana ehanjiswa isisu?

- a. angazi.....[]
 b. ukuphika okuphuzwayo.....[]
 c. ukumelwa okuphuzwayo ngaphezulu kokwehlayelekile.....[]
 d. ukuphika okuphuzwayo ngaphezulu kokwehlayelekile ngokuphinda-
 phinda izikhathana eziningana.....[]
 e. ukuphika okuphuzwayo ngokuphinda-
 phinda izikhathana eziningana ngokuphinda-
 phinda izikhathana eziningana.....[]
 f. ukumhamisa esiphedlela kliniki.....[]
 g. ukumelwa okuphuzwayo ngokuphinda-
 phinda izikhathana eziningana ngokuphinda-
 phinda izikhathana eziningana.....[]
 h. ukuphika okuphuzwayo ngokuphinda-
 phinda izikhathana eziningana.....[]
 i. nokunye (chaza).....[]

28. Zinyathelo zini ezisemqoka okumele uzithathe umayana ehanjiswa isisu eyibona umntwana ukubangqona esivini, esihambisayo? (ziningi izimpendulo ezingashiwo, zibhale zonke)

- a. angazi.....[]
 b. ukupha umntwana ukudla kwakhe kancane kancane ngokuphinda-
 phinda izikhathana eziningana.....[]
 c. nokunye (chaza).....[]

29. Umntwana wakho ungenisa ekhaya?

- a. angazi.....[]
 b. ukuphika okuphuzwayo ngokuphinda-
 phinda izikhathana eziningana.....[]

30. Niwakha kuphi amanzi okuphuza? Ziningi izimpendulo ezingavela.
- a. kumpompi []
 - b. emfuleni..... []
 - c. edamini..... []
 - d. esiphethwini esakhelwe..... []
 - e. esiphethwini esingakheiwe..... []
 - f. amanzi emvula..... []
 - g. okunye (chaza) []

isifo sofuba

31. Uthi yena uke wagula, ekhwehlela noma ephefumula kanzima emasontweni amabili edlule?
- a. yebo..... []
 - b. cha..... []
- Iya ku-35

32. Uthi yena uke waphefumula ngokushesha ephefumula kanzima futhi emasontweni amabili adlule?
- a. yebo..... []
 - b. cha..... []
- Iya ku-35
- c. angazi..... []
- Iya ku-35

33. Waya yini ukuyomelelana umntanakho ngesikhathi enenkinga ekuphucumuleni?
- a. yebo..... []
 - b. cha..... []
- Iya ku-35

34. Wayabekwa wuphi umntanekho ngesibini ukuba aqale masina nokanzima?
- a. kumpompi..... []
 - b. ezweni elide emtholampilo emtholampilo kamahamba..... []
 - c. nokwanda..... []
 - d. kukokotela wangasese..... []
 - e. esisebenzini sezempilo esisemphakathini..... []
 - f. esangomeni..... []
 - g. enyangeni..... []
 - h. kolhipha ithambo..... []
 - i. kunthanzazi..... []
 - j. ibhinqa..... []
 - k. esithathami nase-bhinqa..... []
 - l. naye okunye..... []

35. Zimpawu zini ongathi mawuzibona kumtanakho ziqondene nomgudu wokuphefumula bese ucabanga ukumusa kwabelaphayo? (ziningi izimpendulo ezingashiwo, ziphale zonke)
- a. angazi.....[]
 - b. ukuphefumula ngokushesha noma kanzima.....[]
 - c. ukushona kwesifuba phakathi[]
 - d. ukungakuthandi ukudla.....[]
 - e. ukushisa kakhulu.....[]
 - f. ukukhwehlela.....[]
 - g. ukuguma.....[]
 - h. ukuphefumula ngokunswinswiza noma ngomsindo.....[]
 - i. okunye (naza).....[]

Ukunakekelwa kwabakhulelwe

36. Waya kangaki emtholampilo ngesikhathi ukhulelwe?
- a. kanye.....[]
 - b. kabili.....[]
 - c. kathathu noma ngaphezulu.....[]
 - d. azange ngiye.....[]
 - e. angisakhumbuli.....[]

37. Ukhulelwe vini manje?
- a. yebo.....[]
yana ku-41
 - b. cha.....[]
 - c. angazi.....[]

38. Uyafica vini ukuba ube nomunye umntwana eminyakeni emibili ezayo?
- a. yebo.....[]
yana ku-41
 - b. cha.....[]
 - c. angazi.....[]

39. Wena noma kambe umyeni noma isoka lakho ngabe ikhona vini indlela eniyisebenzisayo ukuvikela ukukhulelwa kwakho?
- a. yebo.....[]
 - b. cha.....[]
yana ku-41

40. Indlela vini okuyiyona eniyisebenzisayo wena okambe umyeni noma isoka kambe ukuvikela ukukhulelwa kwakho?
- a. ukusuka kumqondisi kwenziwe kwenziwe kwenziwe.....[]

- b. umjovo.....[]
- c. iphilisi.....[]
- d. okusemionyeni wesibelethe (iluphu).....[]
- e. ikhondornu noma ijazi lomkhwenyana.....[]
- f. ukuncelisa umntwana ibele lodwa.....[]
- g. indlela yemvelo.....[]
- h. ukungahlangani nhlobo nomkhwenyana / isoka.....[]
- i. ukugxuma.....[]
- j. ukusoma.....[]
- k. umucu osekhalweni.....[]
- l. okunye (kuchaze).....[]

41. Owesifazane uma ekhuelwe kumele aqale nini ukuya kwabezempilo?

(mgubhe aze akutshela ngezinyanga)

- a. ezinyangeni ezintathu zokuqala.....[]
- b. phakathi nokukhulelwa kwakhe.....[]
- c. ezinyangeni zokugcina ekukhulelweni kwakhe 7-9 nyanga.....[]
- d. akukho sidingo sokuba abone abezempilo.....[]
- e. angazi.....[]

42. Zimpawu zini eziyingozi ezingakwenza ukuba ufune ukubona abase-
mtholampilo okanye esibhedlela ngesikhathi ukhulelwe? (ziningi
izimpendulo izenukene, zibhale zonke)

- a. amacansi amancane egazi noma ukopha esithweni
sangasese.....[]
- b. ukubhaleka kwamaqondo.....[]
- c. ukubhaleka kwamaqondo.....[]
- d. ukubhaleka kwamaqondo.....[]
- e. ukwehla kwamandla okukhahlela kokunyakaza komntwana.....[]
- f. izinkinga mavelana nokuchama.....[]
- g. imisiko izinyanga zisephansi.....[]
- h. uma ngake ugabeletha ngokuhlinzwa noma ngake
ngachithelwa isisu.....[]
- i. ukubhaleka kwamaqondo.....[]

43. Umfazi omdala unentwala.....[]

- a. omunye nje ekhaya.....[]
- b. omunye nje ekhaya.....[]
- c. umbelethisi wasemphakathini.....[]
- d. umbelethisi esibhedlela / udokotela.....[]
- e. umbelethisi emtholampilo / udokotela.....[]
- f. omunye (mchaze).....[]
- g. akazi.....[]

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44. Uthi uke wezwa nje ngesifo sengculaza noma ngegciwane layo?
- a. yebo..... []
 - b. cha..... []
 - c. angazi..... []

44.1 uma uthi yebo wezwa kuphi ngengculaza _____

45. Zindlela zini kulezi ezilandelayo ezingakwenza uthole isifo sengculazi noma igciwane layo? **FUNDA IZIMPENDULO** ziningi izimpendulo ezingavela.

- a. ukugqathsulwa umuntu onengculazi
- i. yebo..... []
 - ii. cha..... []
 - iii. angazi..... []

- b. ukuxhawulwa umuntu onengculazi
- i. yebo..... []
 - ii. cha..... []
 - iii. angazi..... []

- c. ukusebenzisa isitulo sebhoshi elilodwa nonengculazi
- i. yebo..... []
 - ii. cha..... []
 - iii. angazi..... []

- d. ukubhangana ngobuili
- i. yebo..... []
 - ii. cha..... []
 - iii. angazi..... []

- e. ukubhangana ngobuili nomuntu othile ehlaleni
- i. yebo..... []
 - ii. cha..... []
 - iii. angazi..... []

- f. ingasuka kumama okhulelwe iye kumifwana ngenkathi umama esakhulelwe
- i. yebo..... []
 - ii. cha..... []
 - iii. angazi..... []

- g. ngokuba nabangani abadingi bezocansi
- i. yebo..... []
 - ii. cha..... []
 - iii. angazi..... []

- h. kumyeni wokho
- i. yebo..... []
 - ii. cha..... []
 - iii. angazi..... []

SH

BDCSP Random Cluster Sample Data 04/08/96

| School Ref. no. | Random no. 507 Name of School | No. of SSA's pupils | Total Pupils | Accum. Total | No. of Clusters |
|------------------|----------------------------------|------------------------|-----------------|-----------------|---------------------|
| 1 | Crowfield | 121 | 376 | 376 | xxxxxxxxxxxxxxxxxxx |
| 2 | Dukuza | 318 | 1,657 | 2,033 | 1 + 2 |
| 3 | Ebhethani | 238 | 1,327 | 3,360 | 3 |
| 4 | Ebusingatha | 104 | 699 | 4,059 | 4 |
| 5 | Emmaus | 105 | 739 | 4,798 | 5 |
| 6 | Ezinyonyana | 144 | 683 | 5,481 | xxxxxxxxxxxxxxxxxxx |
| 7 | Gloeckner Memorial | 154 | 951 | 6,432 | 6 |
| 8 | Hambrook | 94 | 792 | 7,224 | 7 |
| 9 | Hoffenthal | 222 | 773 | 7,997 | 8 |
| 10 | Indanyana | 83 | 674 | 8,671 | 9 |
| 11 | Insukangihlall | 150 | 669 | 9,340 | xxxxxxxxxxxxxxxxxxx |
| 12 | Intumbane | 171 | 732 | 10,072 | 10 |
| 13 | Kwamiya | 174 | 920 | 10,992 | 11 |
| 14 | Langkloof | 93 | 398 | 11,390 | xxxxxxxxxxxxxxxxxxx |
| 15 | Madela | 56 | 425 | 11,815 | 12 |
| 16 | Malotta's Kraal | 42 | 473 | 12,288 | xxxxxxxxxxxxxxxxxxx |
| 17 | Mamponjwana | 154 | 806 | 13,094 | 13 |
| 18 | Masumpa | 153 | 1,043 | 14,137 | 14 |
| 19 | Mondisa | 70 | 461 | 14,598 | 15 |
| 20 | Nogaga | 146 | 931 | 15,529 | xxxxxxxxxxxxxxxxxxx |
| 21 | Mokopela | 47 | 262 | 15,791 | 16 |
| 22 | Nomtshilo | 102 | 618 | 16,409 | xxxxxxxxxxxxxxxxxxx |
| 23 | Nsetheni | 115 | 738 | 17,147 | 17 |
| 24 | Obonjaneni | 176 | 1,083 | 18,230 | 18 |
| 25 | Ogade | 385 | 1,521 | 19,751 | 19 + 20 |
| 26 | Okhombe | 282 | 844 | 20,595 | 21 |
| 27 | Rheibokspruit | 68 | 475 | 21,070 | xxxxxxxxxxxxxxxxxxx |
| 28 | Rooihoek | 61 | 392 | 21,462 | xxxxxxxxxxxxxxxxxxx |
| 29 | Rookdale | 72 | 432 | 21,894 | 22 |
| 30 | Sbavana | 131 | 774 | 22,668 | 23 |
| 31 | Somtseinu | 109 | 665 | 23,333 | xxxxxxxxxxxxxxxxxxx |
| 32 | Vukuzithathele | 118 | 750 | 24,083 | 24 |
| 33 | Vulamehlo | 118 | 611 | 24,694 | 25 |
| 34 | Woodford | 123 | 754 | 25,448 | xxxxxxxxxxxxxxxxxxx |
| 35 | Manduluza | 390 | 1,005 | 26,453 | 26 |
| 36 | Ezinelethu | 74 | 381 | 26,834 | 27 |
| 37 | Mlimcleni | 90 | 315 | 27,149 | xxxxxxxxxxxxxxxxxxx |
| 38 | Tonylana | 82 | 350 | 27,499 | 28 |
| 39 | Ididima | 65 | 559 | 28,058 | xxxxxxxxxxxxxxxxxxx |
| 40 | Kholokazana | 38 | 71 | 28,129 | xxxxxxxxxxxxxxxxxxx |
| 41 | Ngunjini | 72 | 157 | 28,286 | xxxxxxxxxxxxxxxxxxx |
| 42 | Sibanisezwe | 28 | 134 | 28,420 | xxxxxxxxxxxxxxxxxxx |
| 43 | Skraalhoek | 27 | 100 | 28,520 | 29 |
| 44 | Scheeperspruit | 10 | 37 | 28,557 | xxxxxxxxxxxxxxxxxxx |
| 45 | Impandwini | 9 | 25 | 28,582 | xxxxxxxxxxxxxxxxxxx |
| 46 | Intaba | 20 | 116 | 28,698 | xxxxxxxxxxxxxxxxxxx |
| 47 | Oppermanskraal | 37 | 162 | 28,860 | xxxxxxxxxxxxxxxxxxx |
| 48 | Acton Homes | 54 | 406 | 29,266 | xxxxxxxxxxxxxxxxxxx |
| 49 | Eqqumaweni | 47 | 224 | 29,490 | 30 |
| 50 | Bergville | 31 | 231 | 29,721 | xxxxxxxxxxxxxxxxxxx |
| 51 | Vicklands (Berwin) | 63 | 221 | 29,942 | xxxxxxxxxxxxxxxxxxx |
| Totals | | 5,836 | 29,942 | | |
| Avge per school | | 114 | 587 | | |
| No.s per cluster | | 195 | 998 | | |

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Appendix G

KPC SURVEY TRAINING

Monday, January 22, 1996

Supervisors

- | | |
|-------|--|
| 8:00 | Devotions/Introductions/Review of Day's Agenda |
| 8:30 | KPC Survey - Purpose & Objectives |
| 9:00 | Rapid KPC Survey Methodology |
| 10:30 | 15 Minute Break |
| 10:45 | Choosing of Clusters using Primary Schools/Household Selection |
| 12:15 | Lunch |
| 13:30 | Role Supervisor/Interviewer |
| 14:30 | Review Questionnaire |
| 16:00 | Interviewing Principles/Filling in of Questionnaire |
| 16:30 | Practice Interviews and Feedback |

Tuesday, January 23, 1996

Supervisors and Interviewers

8:00 Devotions/Introductions/Review of Day's Agenda
8:30 Brief Description of the Bergville Child Survival Project
9:00 KPC Survey - Purpose & Objectives
9:30 Role of Supervisors/Interviewers
10:15 15 minute break
10:30 Interviewing Principles
12:15 Lunch
13:30 Review Questionnaire
15:30 Interviewing Demonstration

Wednesday, January 24, 1996

- 8:00 Devotions/Administrative Issues/Day's Agenda
- 8:30 Brief review of interviewing principles
- 8:45 Practice Interviews/Feedback
- 10:15 15 minute break
- 10:30 Group discussion on practice interview experiences
- 11:00 Practice Interviews/Feedback
- 12:15 Lunch
- 13:30 Review of Cluster Selection Process
- 14:30 Household Selection Process
- 15:30 Preparation for Field Exercise

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Thursday, January 25, 1996

8:00 Field Exercise - Departure for the Field
 Opportunity to practice using primary schools for cluster selection and
 selection of households within the cluster itself.
 Each interviewer to complete at least one interview observed and
 reviewed by the supervisor.

Lunch in the field

At the end of each exercise, supervisors will have debriefing sessions with their groups to share positive and negative observations, and to discuss any mistakes made in filling out the questionnaire. Supervisor will turn in completed questionnaires for review by the Survey Coordinator. Each team will share observations in the group session the next morning

Friday, January 26, 1996

8:00 Devotions/Administrative Issues

8:30 Group Review of Field Exercise/Problems encountered/Unsettled Issues

10:30 Break

10:45 Finalize any Modifications Needed on Questionnaire

11:15 Review of Schedule for Survey Implementation and Team Assignments for
 up coming week.

12:45 Lunch break

13:30 Core group to meet to discuss any loose ends.
 We can also use this time to look at analysis on Epi-Info/data entry
 process

| | |
|-------------------------------|-------------------|
| Post-it/ FAX (1-800-435-2343) | From: Justin |
| To: M. Holst | Co. RCF |
| Co. | Phone No. 3062597 |
| Dapt. 036 | Fax No. 3061659 |
| Fax No. 4481376 | |

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Ferguson Page 114

CLUSTER SAMPLING FOR IMMUNIZATION COVERAGE

PETER W. KOK

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Abstract—The WHO/EPI cluster sampling method for immunization coverage surveys is part of the course for management training in EPI programmes. The application of this method, based on a framework of villages is impractical in dispersed populations common in many countries in Africa. To make the method work under those circumstances leads to unacceptable bias, which tends to overestimate the real coverage rate. A modified random cluster sampling method for dispersed populations is presented.

INTRODUCTION

The choice of an appropriate method of surveillance and evaluation before implementing an immunization programme is essential to ensure that the very scarce resources available to national programmes are used to its maximal gain.

Sample surveys at certain intervals are usually cheaper and more reliable than setting up and maintaining a continuous surveillance system. It is therefore important to have a critical look at the sampling methods used. Various ways of doing an immunization survey by cluster sampling in the community are used.

Ideally, one should randomly, i.e. by chance alone, select each sample unit separately and independently. A sample unit could be a household, a pregnant mother or, as in our example, the under 5 child. This would need a complete numerical inventory of all sampling units concerned within a defined geographical area. This is usually impractical in developing countries as an inventory of all units in a community does not exist, while the costs of making such an inventory could be prohibitive.

For this reason, cluster sampling has become a popular method to perform immunization coverage surveys (1), even to the extent that oversimplification of sound methodological principles has occurred.

CRITIQUE REGARDING EPI SAMPLING METHOD

The cluster sampling method as used in the World Health Organization's Expanded Programme on Immunization (EPI) and Breastfeeding Surveys (2) as applied in Kenya and other African countries, suffers from serious bias and presents practical problems.

The main limitation in using the EPI cluster sampling method is that the sampling framework is based on the assumed presence of geographically more or less distinct villages and towns.

However, in many parts of Africa, and Kenya in particular, the population is not living in distinguishable villages, but lives rather dispersed in areas which are not easily defined geographically.

In Kenya, the village as sample frame has been replaced by 'sublocation' as the smallest administrative unit for which population data are available. The WHO/EPI method of taking 30 clusters of 7 children each, clusters being selected from a cumulative village population list, has been changed to the selection of 30 clusters from a cumulative sublocation list, thus ensuring a proportional representation of clusters in a given area, usually a district. So far there is no problem, but the next stage of selecting the first household to be visited is very difficult. In the WHO/EPI village model, the instruction requires the field worker to go to the 'centre' of the village, select randomly a direction and count the number of houses between 'centre' and the village boundary, and select from this number of households randomly the first to be visited. If the village is large and heterogeneous, or grossly unequal in its dimensions, this procedure may lead to bias in selecting the first household, as the chance in one direction of being selected can be twice as big as in any other direction, or at least disproportionate. Counting of houses in larger villages or towns is often too difficult and time consuming.

In the case of proportional selection of sublocations instead of villages, those problems are even bigger as distances are usually greater while boundaries are less clearly defined in the field situation. As the 'centre' of a sublocation is usually taken to be one of the trading centres, with the chance that the area's immunization centre is at the same place (bias 1), and to avoid the problem of counting all households from the 'centre' to the boundary of the sublocation, the first household is randomly selected amongst the first 10 households counted from the centre, intentionally excluding the majority of the households from possible inclusion into the sample (bias 2).

As the housing density tends to be higher toward the 'centre', the method of taking the 'next nearest house' as the systematic sampling method, adds the third bias of being centripetal, with a good chance of ending up in and around the centre of the chosen village or trading centre, while the socio-economic and transport situation may differ from the more outlying parts of the sublocation or village, and thus an overestimation may occur of the immunization coverage.

To identify and prepare the villages or trading centres, extensive and very expensive pre-survey by a district health worker is usually done in the Kenyan situation.

MODIFIED CLUSTER SAMPLING

The WHO/EPI cluster sampling method was therefore modified in such a way as to remove to a large

extent the three sources of bias mentioned before, and greatly reduced the cost by simplifying preparation in the field. The method proved to be very suitable in surveying dispersed rural populations in Kenya, and could be particularly useful in an urban situation.

The basis of this sampling method is the assumption, and therefore also its limitation, that the Standard I primary school child is the most randomly and proportionally distributed registered sampling unit in the community. The random selection of 30 Standard I children out of the total Standard I school population for the selection of 30 starting points (households) in a given area is a relatively simple procedure.

In Kenya, good census data are available from the Central Bureau of Statistics (CBS), for district, division, location and sublocation.

From the Ministry of Education or from the District Education Officer (DEO) a list of all primary schools with the number of pupils at each school can be obtained. On the basis of these two sets of data, a simple sample framework can be designed.

The assumption made before has to be tested, because if the schooling level is, arbitrarily, below 70% and certain areas are excluded from schooling, the sampling method would be defective. If that were the case, not every child of Standard I school-age would have the same chance of being included in the survey. The level of schooling can be estimated by dividing the primary school population as obtained from the DEO with the 5-14 year age group obtained from the CBS census data. The distribution of school attendance rates between divisions within the district can be assessed in the same way. As in the WHO/EPI sampling method, instead of making a cumulative list of village populations, a cumulative list of school populations is made.

The total school population is then divided by the number of clusters needed (30) to determine the sampling interval (a). Likewise a random number (n) is selected within the size of sampling interval. The first school selected is the one attended by the n th child, the second school is the one attended by the n th + a child, the third by the n th + $2a$ etc., till 30 schools have been identified.

On the (school) day of the survey the investigation team, preferably with added local members of the community, visits the school, examines the attendance list of Standard I kept by the headmaster of the school, and randomly chooses a Standard I child from amongst all the listed Standard I children. This child or his elder sibling directs the team to his or her house. To remove the bias 'household with school child', the next nearest household is the starting point for sampling households till at least 7 children in the desired age group have been surveyed.

Illustration from Machakos District, Kenya

An immunization coverage study carried out in Machakos District in Kenya may serve as an example. The population estimate (1981) was 1,091,000 and the number of children 5-14 was 327,000 (CBS). A list of schools with the number of children in each grade was obtained from the DEO, showing a primary school population of 314,600 children in 788 schools. The proportion of children attending school is estimated as $314,600/327,000 = 96\%$. Further

Table 1. Cumulative listing schools, Machakos District, Kenya, 1981

| School | Enrollment | Cumulative all pupils* | Cumulative Standard I |
|-------------|------------|------------------------|-----------------------|
| 1. Jongani | 281 | 281 | 130 |
| 2. Kihimani | 603 | 1524 | 313 |
| 3. Kawakutu | 221 | 1945 | 369 |
| 4. Kaumoni | 383 | 2328 | 496 |
| 5. Kasere | 363 | 2691 | 579 |
| Total | | 314,600 | 69,220 |

analysis of the distribution rate by geographical division showed that no division had a school attendance rate of below 89%. In view of the increasing drop-out rate with increasing grade in schooling, the Standard I child was taken as the basis for our calculations.

Analysis for the Machakos District showed that the mean proportion of Standard I school children in the total school age population (CBS) by division was 18.5% with a standard deviation of 1.5%.

The assumption therefore that the Standard I school child is randomly and proportionally distributed in Machakos District seems valid.

The 788 schools in the Machakos District were listed, with the number of pupils attending, and if available, the number of Standard I children (Table 1).

The sampling interval for Standard I pupils was obtained by dividing the total number of children (69,220) by the number of clusters (30), giving 2007. Next a random number between 0000 and 2007 was chosen, in our example 0404, representing the first child. This 404th child was attending school No. 4 Kaumoni. The second school was obtained by adding the sample interval to the first random number, $0404 + 2007 = 2411$. This school at which the 2411th child was attending could be identified from the list. This process was repeated till all 30 schools were identified. A list of these schools and their address was compiled, and the survey could start. Each school was subsequently visited, the Standard I school attendance list was obtained from the headmaster, and from this list a child was randomly chosen. Permission was obtained for the child or elder sibling to bring the team to the pupil's house, from where the next nearest house was taken as the starting point for the cluster survey. The child was then returned to the school.

Table 2. School attendance rates in some districts in Kenya, 1981

| District | School population | No. of schools | School attendance rate (%) |
|-----------------|-------------------|----------------|----------------------------|
| Rift Valley | 81,000 | 226 | 82* |
| Kenya (1) | 23,000 | 201 | 71* |
| Machakos (2) | 327,000 | 788 | 96 |
| Kisumu (3) | 187,000 | 395 | 78 |
| Uasin Gishu (4) | 81,000 | 215 | 84 |
| Trans Nzoia (5) | 77,000 | 121 | 85 |
| Bura (6) | 86,000 | 263 | 92 |
| Kisumu (6) | 111,718 | 409 | 81 |
| Siaya (6) | 149,500 | 472 | 102 |

*Does vary.
1—Coast; 2—Eastern; 3—Central; 4—Rift Valley; 5—Western Province; 6—Nyanza Province.
Source: Ministry of Education.

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PROBLEMS AND LIMITATIONS

The sampling method is dependent on the school, and therefore cannot be done during school holidays and weekends. In case the school attendance list for the year in which the survey takes place is not yet available, the school list of the previous year could be used to identify schools, as it might be expected that changes in the number and relative attendance of schools are small over such a limited period. The actual child is always selected physically at the school during the survey.

A special case is the boarding school with pupils from very far away. Their wider distribution and overlap of other schools might not disturb the representativeness if the number is small. A limit as to the distance from the school a pupil is living can be fixed beforehand, depending on the nature and population densities of the area to be surveyed.

This method using the schools as sampling framework is widely applicable in Kenya as school attendance rates are generally high (Table 2).

The assumption of random proportional distribution of school children in the community could not

be made readily in the (partially Islamic) Coastal Districts of Kenya as less than the arbitrary 70% of the children were going to school, however further examination revealed that a striking discrepancy in school attendance rates between boys and girls existed: less than 50% of the girls were going to school, while well over 70% of the boys were attending. The sampling method using schools could still be used, taking for the cumulative list of school attendances only the number of boys per school.

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Community-based survey versus sentinel site sampling in determining the nutritional status of rural children

Implications for nutritional surveillance and the development of nutritional programmes

G. C. Solarsh, D. M. Sanders, C. A. Gibson, E. Gouws

A study of the anthropometric status of under-5-year-olds was conducted in the Nqutu district of KwaZulu by means of a representative community-based sample and concurrent samples from primary health care clinics, preschools and primary schools.

The first objective of this exercise was to determine the extent of acute nutritional stress in the district as an indication of the appropriateness of food relief efforts in the region. The absence of wasting and the high prevalence of stunting (37.5%) in the community-based sample suggested that the main problem is chronic socio-economic underdevelopment, rather than a severe or immediate lack of food. The fact that fewer than 20% of households are in any way reliant on domestic production for their maize requirements explains why the recent drought has not had a greater impact on the nutritional status of this vulnerable group. This study confirms that the more recent emphasis of the National Nutrition and Social Development Programme on social development is appropriate.

An equally important objective of this study was to evaluate the usefulness of clinics, preschools and schools as sites for the collection of anthropometric data and the development of nutritional programmes. This preliminary attempt to develop the methodology for district-based nutrition surveillance suggested that all these sites have limitations both in respect of data collection and community access. The implications of using these sites and the developments needed to improve their usefulness in a future nutrition surveillance system are discussed.

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The nutritional status of black South African preschool children from rural and peri-urban communities has been assessed in numerous previous cross-sectional anthropometric surveys. In studies spanning the past 10 years and conducted in different social settings, "a consistent finding has been the presence of a high prevalence of height-for-age (HFA) deficits or stunting (25 - 47%), a significant but lower prevalence of weight-for-age (WFA) deficits (5 - 14%) and a low prevalence of weight-for-height (WFH) deficits or wasting (0,5 - 3,5%). Since young children are, for biological reasons, especially vulnerable to the effects of food insufficiency, nutritional status assessments in this age group provide a useful window on the wider community. This picture of high levels of stunting with only minimal evidence of wasting suggests that the main problem in these communities is chronic undernutrition. This is likely to be a result of long-standing dietary inadequacy reflecting socio-economic deprivation, rather than acute nutritional stress caused by severe food lack or serious illness.

In 1991, following the presentation of the annual budget in which a new value-added tax was announced, the South African government made R220 million available for a nationwide poverty relief programme. This programme, which rapidly took the form of a food aid programme, was thought to be a necessary step to support the 'poorest of the poor' at a time of severe economic recession and high unemployment. Anticipated crop failures as a result of a severe drought were expected to aggravate household food insecurity further.

From the programme's inception the absence of any readily available and up-to-date nutritional data made it difficult to confirm that recent socio-economic and climatic conditions had indeed resulted in acute nutritional stress, a usual precondition for emergency food relief. Even if an acute deterioration in nutritional status was assumed on the basis of prevailing conditions, the absence of a surveillance system designed to identify specific at-risk groups made targeted nutritional interventions impossible.

This in-depth study of the nutritional status of children in the Nqutu district was undertaken as part of a broader study to determine the presence of acute nutritional stress in Natal/KwaZulu, and was intended to inform the regional relief efforts of what is now known as the National Nutrition and Social Development Programme (NNSDP).

At the same time this study was seen as an opportunity to investigate some of the methodological issues involved in setting up a national nutritional surveillance system. In this regard there was special interest in answering the following questions: (i) does an assessment of nutritional status at different sentinel sites in a community (e.g. clinics, preschools, schools) vary significantly from that obtained from a cross-sectional survey in the same community? (ii) how do the sentinel sites differ from each other both as sites for data collection and in their potential for programme implementation? (iii) what are the implications of these differences for nutritional surveillance and programme development? and (iv) what would be the most appropriate anthropometric indicator of nutritional status in a proposed surveillance system?

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Methods

The study was conducted over a 6-week period between 12 October and 27 November 1992.

Area of study

The Nqutu magisterial district, situated in the hilly inland zone of central KwaZulu, has an estimated population of 200 000 people. This district has been the site of at least 2 previous nutritional status assessments in children under the age of 5 years. The first, performed in 1974, showed that 39% of children were stunted and 27% were significantly underweight for age (IWF/A).¹ A second survey in 1983, using WFI to determine whether a severe drought during the previous year had resulted in acute nutritional stress, found no evidence of wasting.¹

Although no district is likely to be representative of the whole region, the presence within the Nqutu district of deep rural populations typical of a large number of central KwaZulu districts, together with fairly large formal and informal townships, suggests that the findings in this district will be applicable to populations in other parts of the region and possibly other homeland areas.

Cluster survey

Kok's modification² of the standard World Health Organisation cluster survey method^{3,4} was used for the community-based survey. This method uses the class 1 primary school population rather than the total population, both as a basis for cluster selection and to define random starting points for each cluster. Pre-conditions for its use are a primary school attendance rate in the early classes of at least 70%, and the knowledge that a significant proportion of children are not attending schools outside the district. Both these conditions were considered to be fulfilled in the Nqutu district. A detailed description of this method is provided elsewhere.⁵ Stratification into urban-rural subsamples required that the usual 30 x 7 cluster sample be increased to 40 x 7.

All clusters around the central market town of Nqutu and those in the large northern township of Mondlo were categorised as *urban*. The remaining clusters were regarded as *rural* and further classified as *rural (accessible)* when the starting point was reached from a road on the public transport route, and *rural (inaccessible)* when the starting point was from a road that was off the public transport route.

The following data were collected for each child between the ages of 6 months and 59 months: sex, date of birth, number of clinic attendances in the previous 12 months, weight, length and mid-upper-arm circumference (MUAC). Dates of birth and the details of clinic visits were classified as *documented* if present on a Road-to-Health card (RTHC), as *reported* if provided by the biological mother and as *doubtful* if neither of the above sources applied.

In each household respondents were asked to indicate what proportion of the maize eaten by household members had been grown at home, i.e. none, less than half, more than half, or all. This question was intended to measure the extent to which the population surveyed relied on subsistence agricultural production, and to identify groups at risk of nutritional stress as a direct result of the drought.

Sentinel site sampling

A representative sample of 140 children was obtained during the same 6-week period from each of the following sentinel sites, viz. primary health care (PHC) clinics, preschools and primary schools (class 1).

A list was compiled of all the existing fixed and mobile clinics, preschools or creches, and primary schools in the Nqutu district. In each category a cumulative total of attendances or enrolments, based on figures from the previous year (for schools) and previous quarter (for preschools and clinics), enabled a sampling interval to be calculated and a sample that was proportional to its size to be drawn from each site. On the day in question we selected the children required from each site by taking the first arrivals at clinics, and by using random number tables to select children from attendance lists in the case of preschools and schools.

As in the cluster survey, sex, date of birth and measurements of weight, length and MUAC were obtained from each child. Since the age ranges of children at the different sites were not known before the study, MUACs were measured on all children, but only analysed in those between the ages of 1 and 5 years. Dates of birth or ages were obtained and recorded at clinics in the same way as for the survey. At preschools and schools ages were obtained from the school registers. Although this information is said to be obtained from RTHCs or birth certificates, the reliability of these data was not specifically validated.

Anthropometric measurements

In the community-based survey the measurements were taken by 4 teams each comprising a senior PHC nurse, a staff nurse, a health assistant and a community health worker. Data collection in the field was preceded by a 1-day training workshop during which each team member performed multiple measurements under the supervision of the field work co-ordinator (C.A.G.), followed by a trial cluster in the community under full field conditions.

All the data from the sentinel sites were collected by the field work co-ordinator and a trained assistant.

Weights were measured to the nearest 0.1 kg with Salter hanging scales in the survey and at the clinics, and platform 'bathroom' scales at the preschools and primary schools. Scales were calibrated each morning against a known weight. Infants and toddlers were weighed unclothed and older children were weighed in underwear only. A portable plywood board, mounted on a right-angled base and fitted with a metal tape measure and sliding headboard, was used to measure recumbent length in children less than 2 years of age and the upright height of children 2 years or older. Standard technique was used and lengths recorded to the nearest 0.1 cm. Plastic tape measures were used to measure MUAC and these were also recorded to the nearest 0.1 cm.

Data analysis

Z-scores for the three anthropometric indices, viz. WFA, IIA and WFI, were calculated using Aultra⁶ public domain software designed by the Centers for Disease Control. Z-scores are recommended by the WHO for monitoring groups of children for public health and research purposes.⁷ Since Z-scores are comparable across ages and indices, a

particular score reflects an equivalent deviation from the median for children of any age, in respect of HFA or WFH as well as WFA."

The chi-square test was used for the comparison of anthropometric indices between the community-based sample and each of the sentinel site samples in turn. Pearson's correlation coefficient was calculated for the association between MUAC and WFH.

Table I. Sex and mean age by sampling site

| Site | No. | Male | | Female | | Mean Age (SD) (months) |
|-----------|-----|------|------|--------|------|---------------------------|
| | | No. | % | No. | % | |
| Survey | 300 | 135 | 45.0 | 165 | 55.0 | 37.1 (22.0 - 52.2) |
| Clinic | 138 | 66 | 47.8 | 72 | 52.2 | 14.0 (5.5 - 22.5) |
| Preschool | 171 | 90 | 52.6 | 81 | 47.4 | 64.3 (53.3 - 75.3) |
| School | 133 | 67 | 50.4 | 66 | 49.6 | 92.1 (77.3 - 106.9) |
| Total | 742 | 358 | 48.2 | 384 | 51.8 | 47.9 (18.7 - 77.1) |

Results

The final sample size, gender breakdown and mean ages for the survey and each of the sentinel sites are shown in Table I. The larger preschool sample is explained by the fact that 2 unlisted preschools were discovered after data collection had already commenced, and rather than redraw the whole sample we simply added the extra preschools to the sample.

A small number of children, for whom details of age or sex were not available or in whom anthropometric indices with significantly outlying Z-scores (greater than 6.0 or less than -6.0) were recorded, were excluded from all further calculations based on anthropometric indices. This explains the difference between the final sample sizes and those presented in the data analysis.

Table II. WFA by sampling site

| Age (months) | Survey | | | Clinics | | | Preschools | | | Schools | | | Total | | |
|--------------|---------------|-------------------------|------|--------------|-------------------------|------|--------------|-------------------------|------|----------------|-------------------------|------|---------------|-------------------------|------|
| | No. | No Z-score < -2.0 | % | No. | No Z-score < -2.0 | % | No. | No Z-score < -2.0 | % | No. | No Z-score < -2.0 | % | No. | No Z-score < -2.0 | % |
| 6.0 - 11.99 | 1 | 0 | 0 | 62 | 6 | 9.7 | 0 | 0 | 0 | 0 | 0 | 0 | 63 | 6 | 9.5 |
| 12.0 - 23.99 | 67 | 7 | 10.5 | 58 | 11 | 18.9 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 18 | 14.4 |
| 24.0 - 47.99 | 138 | 10 | 7.3 | 13 | 2 | 15.4 | 8 | 0 | 0 | 0 | 0 | 0 | 159 | 12 | 47.6 |
| 48.0 - 71.99 | 85 | 5 | 5.9 | 0 | 0 | 0 | 95 | 12 | 12.6 | 3 | 0 | 0 | 183 | 17 | 9.3 |
| 72.0 - 95.99 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 5 | 13.2 | 83 | 16 | 19.3 | 122 | 21 | 17.2 |
| > 96.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 10 | 27.0 | 37 | 10 | 27.0 |
| Total | 291 | 22 | 7.56 | 133 | 19 | 14.3 | 141 | 17 | 12.1 | 123 | 26 | 3.8 | 689 | 84 | 12.2 |
| 95% CI | (4.52; 10.60) | | | (8.28; 20.1) | | | (4.46; 19.7) | | | (13.94; 28.34) | | | (9.75; 14.63) | | |
| P-value | | | | 0.032 | | | 0.126 | | | < 0.0001 | | | 0.001 | | |

Table III. HFA by sampling site

| Age (months) | Survey | | | Clinics | | | Preschools | | | Schools | | | Total | | |
|--------------|----------------|-------------------------|------|----------------|-------------------------|------|----------------|-------------------------|------|----------------|-------------------------|------|----------------|-------------------------|------|
| | No. | No Z-score < -2.0 | % |
| 6.0 - 11.99 | 1 | 0 | 0 | 62 | 5 | 8.1 | 0 | 0 | 0 | 0 | 0 | 0 | 63 | 5 | 7.9 |
| 12.0 - 23.99 | 67 | 27 | 40.3 | 58 | 17 | 29.3 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 44 | 35.2 |
| 24.0 - 47.99 | 138 | 48 | 34.8 | 13 | 2 | 15.4 | 8 | 2 | 25.0 | 0 | 0 | 0 | 159 | 52 | 32.7 |
| 48.0 - 71.99 | 85 | 32 | 37.7 | 0 | 0 | 0 | 95 | 13 | 13.7 | 3 | 0 | 0 | 183 | 45 | 24.6 |
| 72.0 - 95.99 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 11 | 28.9 | 83 | 17 | 20.5 | 122 | 29 | 23.8 |
| > 96.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 12 | 32.4 | 37 | 12 | 32.4 |
| Total | 291 | 107 | 36.8 | 133 | 24 | 18.0 | 141 | 26 | 18.4 | 123 | 29 | 23.6 | 689 | 187 | 27.1 |
| 95% CI | (31.23; 42.31) | | | (12.06; 25.26) | | | (12.04; 24.84) | | | (16.08; 31.08) | | | (23.84; 30.44) | | |
| P-value | | | | < 0.0001 | | | < 0.0001 | | | 0.009 | | | < 0.0001 | | |

Table IV. WFH by sampling site

| Age (months) | Survey | | | Clinics | | | Preschools | | | Schools | | | Total | | |
|--------------|--------|-------------------------|---|-----------|-------------------------|-----|---------------|-------------------------|-----|---------------|-------------------------|-----|-------------|-------------------------|------|
| | No. | No Z-score < -2.0 | % | No. | No Z-score < -2.0 | % | No. | No Z-score < -2.0 | % | No. | No Z-score < -2.0 | % | No. | No Z-score < -2.0 | % |
| 6.0 - 11.99 | 1 | 0 | 0 | 62 | 2 | 3.2 | 0 | 0 | 0 | 0 | 0 | 0 | 63 | 2 | 3.2 |
| 12.0 - 23.99 | 67 | 0 | 0 | 58 | 1 | 1.7 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 1 | 0.8 |
| 24.0 - 47.99 | 138 | 0 | 0 | 13 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 159 | 0 | 0 |
| 48.0 - 71.99 | 85 | 0 | 0 | 0 | 0 | 0 | 95 | 9 | 9.5 | 3 | 0 | 0 | 183 | 9 | 4.9 |
| 72.0 - 95.99 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 2 | 5.3 | 83 | 7 | 8.4 | 122 | 9 | 7.4 |
| > 96.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 2 | 5.4 | 37 | 2 | 5.4 |
| Total | 291 | 0 | 0 | 133 | 3 | 2.2 | 141 | 11 | 7.8 | 123 | 9 | 7.3 | 689 | 23 | 3.34 |
| 95% CI | (0; 0) | | | (0; 4.74) | | | (3.37; 12.23) | | | (2.72; 11.92) | | | (2.0; 4.68) | | |
| P-value | | | | 0.031 | | | < 0.0001 | | | < 0.0001 | | | < 0.0001 | | |

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In the community-based sample, dates of birth or ages were documented in 63,3% of children and obtained from mothers following a careful interview in a further 27,7% of cases. Only in the remaining 9% were ages considered doubtful. In the clinic sample 97,1% of dates of birth or ages were documented. Attendance at clinics in the previous 12 months, assessed in the community-based sample only, was either documented or reported by the mother in 87,7% of cases.

The percentage of children with Z-scores of less than -2.0 for WFA in the survey was compared with the corresponding percentage at clinics, schools and preschools. While clinics and preschools had a substantially higher percentage of children who were underweight than did the survey, it was only in the school children that this difference achieved significance (Table II). Similar comparisons in respect of other anthropometric indices showed a highly significant difference between the survey and each of the sentinel sites in the case of HFA (Table III) and, in the case of WFH (Table IV), a significant difference between the survey and schools and preschools.

The stratification of anthropometric status in the community-based sample into urban, rural accessible and rural inaccessible groups reveals very little difference in WFA deficits between these strata, but shows that there is a progressive increase in stunting rates from urban, to rural accessible, to rural inaccessible groups (Table V).

Table V. Anthropometric indices by urban or rural strata

| Anthropometric indices | Z-scores less than -2.0 | | | | | |
|------------------------|-------------------------|------|------------------|------|--------------------|------|
| | Urban | | Rural accessible | | Rural inaccessible | |
| | No | % | No | % | No | % |
| WFA | 4 | 8.2 | 14 | 7.7 | 4 | 6.7 |
| HFA | 14 | 28.6 | 64 | 35.2 | 29 | 48.3 |
| WFH | 0 | 0 | 0 | 0 | 0 | 0 |

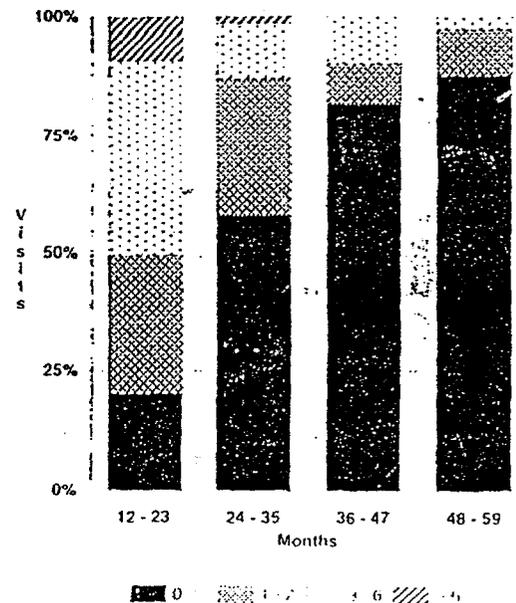
One hundred and sixty of 174 households sampled during the community-based survey provided information about domestic maize production and the proportion of maize from this source consumed by the household each year. Of households thus sampled, 81,2% were completely dependent on bought maize (Table VI).

Table VI. Household maize consumption

| Proportion of maize that comes from domestic production | Households | |
|---|------------|------|
| | No. | % |
| None | 130 | 81,2 |
| < half | 7 | 4,4 |
| > half | 20 | 12,5 |
| All | 3 | 1,9 |
| Total | 160 | 100 |

Clinic attendance in the 12 months preceding the survey was analysed by year of age from the community-based sample (Fig. 1). This shows that 80% of children aged 12 - 23 months attended a PHC clinic on one or more occasions during this period but that there was a dramatic fall-off in attendance thereafter. When 3 or more visits were used as

the cut-off point, only 50% of children in the 12 - 23 month group, 12% in the 24 - 35-month group, 10% in the 36 - 47-month group and 2% in the 48 - 59-month group were included.



Based on community-based survey

Fig. 1. Clinic visits in under-5s by year of age.

WFH was compared with MUAC in 353 children from the combined sample between the ages of 1 and 5 years (Fig. 2). A Pearson's correlation coefficient of 0,43 suggested only a moderate correlation between these two measurements of wasting. Although WFHs with Z-scores of ≤ -2.0 and MUACs of < 13.5 cm identified similar proportions of the sample (1,13% and 2,83%, respectively) as wasted, different children were identified with the two measures.

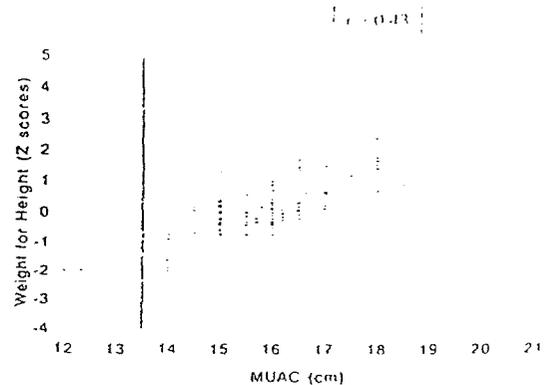


Fig. 2. WFH versus MUAC.

Discussion

This survey of nutritional status in black South African under-5s has again shown that, in spite of extreme socio-economic and climatic adversity, there is a relatively low prevalence of wasting and therefore little evidence of significant acute nutritional stress in this population. The main problem continues to be one of stunting which, at a level of 37.5%, suggests severe and long-standing socio-economic underdevelopment. Stunting rates were found to be significantly higher in rural than in urban children and this differential was particularly obvious in children from inaccessible rural areas. In the absence of wasting, the percentage of children who are underweight-for-age (UWFA) should be more or less equivalent to the percentage of children who are 'underheight'-for-age (UHFA).¹⁶ The fact that much lower degrees of UWFA than UHFA have been recorded suggests that the children in the Nqutu district are relatively overweight for height. This picture, which has also emerged from many previous South African studies, has never been explained and requires further elucidation. It also has implications for the use of WFA as an indicator of nutritional status.

Wasting rates of 7.8% and 7.2%, respectively, have identified accessible groups for immediate nutritional support at preschools and schools. The reason for a higher wasting rate at these two sentinel sites than in the community-based survey or at clinics is not immediately clear.

The substantial differences in the anthropometric indices obtained in the community-based survey, compared with those obtained from each of the sentinel sites, confirm that sentinel site samples, for a number of possible reasons, are not truly representative and therefore of limited value in a one-off assessment of the nutritional status of a population.

A comparison of the mean ages of children sampled at each of the sentinel sites reveals that these sites capture children from very different age groups and that none of them has satisfactory access to children between the ages of 2 years and 4 years, when protein energy malnutrition is likely to be most prevalent. This disparity in age is one possible cause of the difference in anthropometric status between survey and sentinel site samples.

The fact that the people in this district are minimally reliant on domestic food production for their basic nutritional needs suggests that the recent drought is unlikely to have had a direct or rapid adverse effect on nutritional status. This may not be the case in districts where people are known to be more dependent on local food production; separate assessments are needed in those areas.

Nutritional surveillance is a system of routine data collection to monitor changes in nutritional indicators over time, to give warning of impending crises, to identify at-risk populations and to monitor the effectiveness or ineffectiveness of existing programmes and policies.¹⁶ Different types of data may be used for these varied applications but the essential features are that the data are collected over time, as in repeated cross-sectional surveys or in regular reporting of clinic-based WFA data, and that the data collection and analysis are linked to decision-making.

Cross-sectional surveys have the advantage of producing carefully controlled and thus accurate data over a short period of time, but they are complex and expensive exercises, often cause disruption by taking staff away from

other activities, are usually planned centrally and therefore deprive peripheral workers of the opportunity to evaluate their own work, and need to be repeated on a regular basis if they are to produce trend data.

Although sentinel site data are unlikely to provide the true prevalence of undernutrition in the community, this is less of a problem if a trend rather than an absolute prevalence is required. Since these data are collected continuously, arrangements can be made to report more or less frequently, thereby producing short-, medium- or long-term trends, depending on the needs of the programme. This focus on sentinel sites also offers a structural link between data collection and implementation by involving people working at the sentinel sites in the collection of data necessary for an informed programmatic response.

In view of the numerous benefits offered by sentinel site data for continuous monitoring, a more detailed comparison of different sentinel sites is required, both in terms of the accuracy with which they reflect the size and nature of the problem, and the access to nutritional and social development programmes that they provide for at-risk populations.

PHC clinics appear to be natural sites for both data collection and programme implementation and thus appropriate units at which to develop a nutritional surveillance system. These data can be used to generate trends simply by including the percentage of children who are below the defined cut-off point in the quarterly clinic statistical returns. Another, and perhaps more useful, alternative is for clinic staff to keep a separate RTHC or so-called master card, on which the indices of all children seen that month are plotted, to provide a graphic month-by-month comparison of the anthropometric status of all clinic attenders.

WFA assessments are already performed on all children as part of routine growth monitoring at clinics, and the staff are well versed in the relatively simple tasks of weighing and plotting. The high percentage of RTHC carriage in children attending clinics means that reliable ages are usually available. WFA is a composite measure of all tissues and therefore reflects both wasting and stunting. While rapid deterioration in WFA status over a short period invariably indicates wasting, a more gradual change over a longer period may indicate either stunting, wasting or a combination of the two, and it will be necessary to distinguish between these different processes if coherent interventions are to follow. It is suggested that the additional measurement of MUAC in all children aged 1 - 5 years at 6-monthly intervals will provide specific evidence of the extent of wasting and help to interpret the longer-term WFA trends. Although this study has only shown a moderate correlation between WFA and MUAC in individual children, the identification of similar proportions of children as wasted, by the two methods, justifies the use of MUAC as a broad intuitive measure of wasting and circumvents the more complex task of height measurement. This finding accords with several other studies and recommendations.^{17,18}

Since stunting is a marker of chronic underdevelopment and poverty, improvements in HFA status will take many years. It is therefore suggested that HFA measurements not be included in a sentinel site surveillance system and that stunting be monitored in periodic community-based cross-sectional surveys.

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A mean age of 15 months among clinic attenders and the demonstration in the community-based survey that there is a rapid fall-off in clinic attendance after the age of 2 years suggest that nutritional programmes based at the clinics are unlikely to reach most children over the age of 2 years. If the clinics are to function as sites for both nutritional surveillance and interventions, coverage of the under-5s in their catchment areas will need to be improved.

Although preschools should theoretically offer access to the 2 - 5-year age group, the finding in this study of a mean age of 64 months at preschools indicates that the preschools in the Nqutu district cater for a much older age group. Furthermore, the small number of preschools, their relatively small enrolments and their concentration in the more urbanised parts of the district suggest that they are particularly unrepresentative and provide limited coverage even within their narrow age band. The fact that dates of birth, transcribed from birth certificates and RTHCs, are available for most children from the preschool register, suggests that ages are accurate and that age-dependent anthropometric indices can therefore be used. The use of preschools as sites for nutritional surveillance and interventions will require the development of a more extensive network of preschools, the extension of their coverage to a younger age group, the formalisation of their relationship to the health sector and the assistance of personnel in their tasks of data collection and programme development.

Supplementary feeding programmes have been used elsewhere to develop a network of feeding points for preschool children in which mothers and other community members have been involved in the identification of at-risk children through simple anthropometric measurements, the feeding of children and the development of gardens around the feeding points.¹⁸ Such an organisational structure could be used to develop a more permanent preschool network with the institutional capacity for long-term nutritional surveillance.

Primary schools offer a high coverage in the 6 - 8-year age group, a well-developed and well-distributed network of schools throughout the district, and the potential capacity to handle anthropometric surveillance and the supervision of nutritional programmes. Although ages are available from the school register, a spot check in a previous survey suggested that birth certificates and RTHCs on which these ages are based, had in many cases been obtained long after birth to satisfy school entry requirements.¹⁹ There is therefore some doubt about the validity of age-dependent anthropometric indices in this group.

Primary schools share with the other sentinel sites an inability to access preschool children directly. School-based nutritional activities must either settle for surveillance and interventions confined to this captive population, e.g. school feeding or nutrition education programmes, or the use of school-based anthropometric trends as a proxy for the nutritional status in preschoolers, to launch an outreach initiative of some kind to under-5s. Experience from elsewhere²⁰ again suggests that primary schools may be successfully used in the screening of the community for nutritionally at-risk children and in bringing these children to their schools or other centres where nutritional programmes are being run — so-called 'child-to-child' programmes.

The recent movement of the State into the area of nutritional support and social development has highlighted the need for systematic data collection to guide this process and the necessity for data collection to be closely linked to programme implementation. Against this background this paper has attempted to explore the relative place of community-based surveys versus sentinel sites in the provision of informational support for these programmes.

The finding that there is little evidence of acute nutritional stress in the Nqutu district indicates that the recent shift in focus by the NNSDP from food aid to social development is not only appropriate in terms of its emphasis on the process of empowerment, but correctly identifies poverty, with its complex antecedents, as the target for its attention.

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