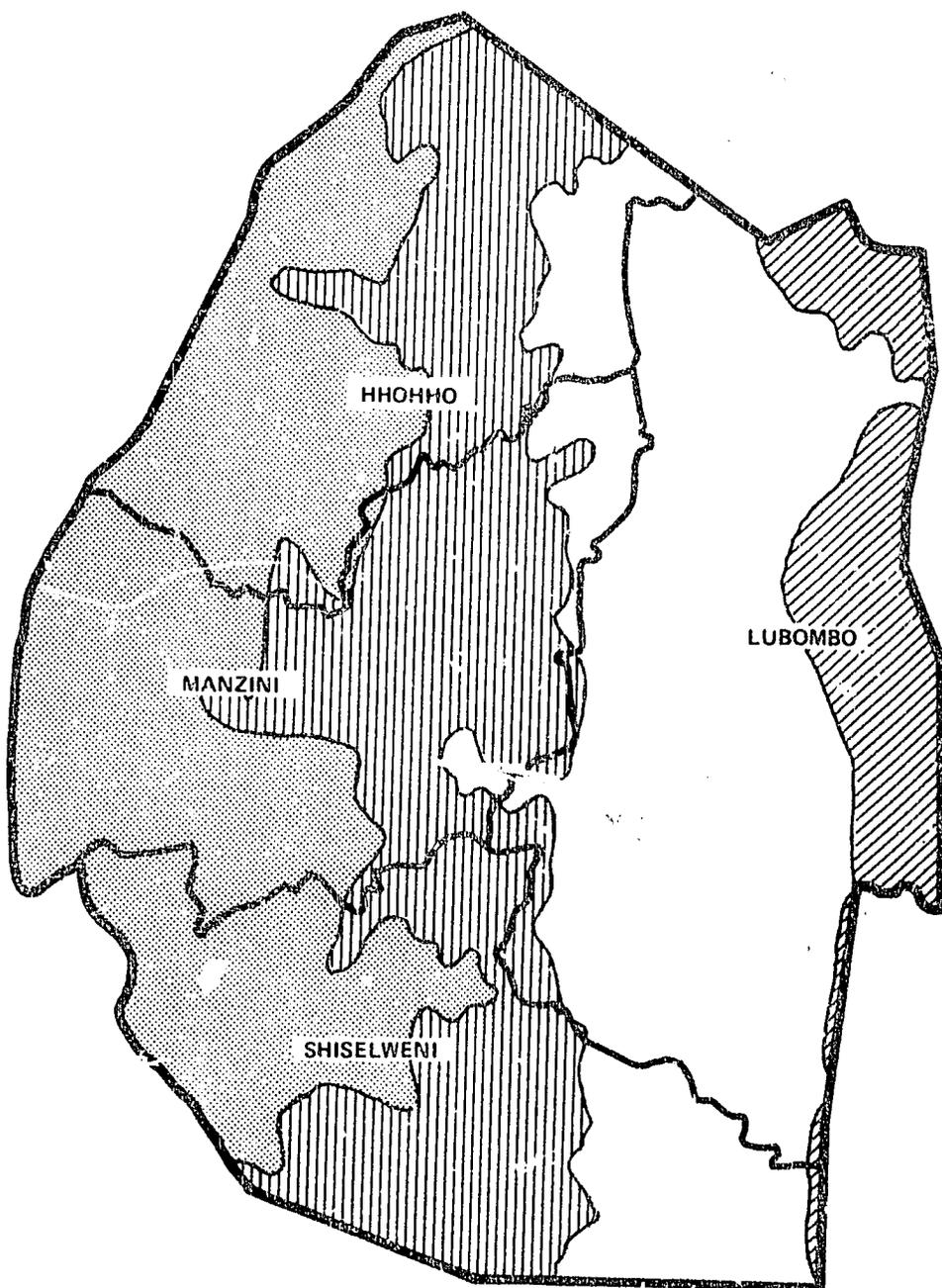


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Swaziland

National Nutrition Status Survey Nutritional Status Report 1983



Conducted by the Government of Swaziland with the assistance of

U.S. Department of Health and Human Services
Public Health Service
Centers for Disease Control

in cooperation with
The United States Agency for International Development
Office of Nutrition

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SWAZILAND NATIONAL NUTRITION STATUS SURVEY, 1983

NUTRITIONAL STATUS REPORT

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SWAZILAND NATIONAL NUTRITION STATUS SURVEY, 1983
CONTENTS

CONTENTS	2
ACKNOWLEDGMENTS	4
PREFACE	7
OVERVIEW AND RECOMMENDATIONS	8
INTRODUCTION	8
NUTRITIONAL STATUS	10
Nutritional Status Discussion Issues: Programmatic	12
Nutritional Status Discussion Issues: Data	14
INFANT-FEEDING PRACTICES	16
Infant-Feeding Discussion Issues: Programmatic	17
Infant-Feeding Discussion Issues: Data	17
IMMUNIZATIONS	18
Immunization Discussion Issues: Programmatic	20
Immunization Discussion Issues: Data	22
DIARRHEA	23
Diarrhea Discussion Issues: Programmatic	23
Diarrhea Discussion Issues: Data	24
MORTALITY	24
SWAZILAND FOOD AND NUTRITION WORKSHOP:	
SYNOPSIS OF RECOMMENDED PROJECTS	25
Agriculture	25
Education	26
Health	26
Food Assistance	27
SWAZILAND FOOD AND NUTRITION WORKSHOP:	
NEED FOR COMMON SUPPORT	27
Continued Research	28
Surveillance System	28
SWAZILAND FOOD AND NUTRITION WORKSHOP:	
NEED FOR COORDINATION AND CENTRAL SUPPORT	28
NUTRITIONAL STATUS	31
INTRODUCTION	31
BACKGROUND	31
Previous Nutrition Studies	31
Indices of Malnutrition	32
Reference Values	32
Anthropometric Indices	33
METHODS	34
Measurements	34
Analysis	35
Anthropometric Editing Criteria	36
RESULTS	36
Response Rate	36
Anthropometric Z-Scores: Height-for-Age	37
Rural Versus Peri-Urban	37
Age	37
Sex	37

Characteristics of Enumeration Area	38
Zone	38
Land Tenure	38
District	39
Homestead/Household Characteristics	39
Maternal Characteristics	42
Paternal Characteristics	45
Utilization of Medical Care	46
Method of Infant Feeding	46
Anthropometric Z-Scores: Weight-for-Height	47
Rural Versus Peri-Urban	47
Age - Sex	47
Zone, Tenure, District	47
Other Factors	47
Anthropometric Z-Scores: Weight-for-Age	47
Rural Versus Peri-Urban	47
Age-Sex	47
Zone, Tenure, District	48
Other Factors	48
Attendance at Maternal-Child Health Clinics	48
Presentation of Data Using Percents of Median	49
COMPARISON OF SWAZILAND SURVEY WITH OTHER AFRICAN SURVEYS	49
DISCUSSION	50
REFERENCES	56
TABLES	58
APPENDIX 1: Procedures for Anthropometric Measurements	143
APPENDIX 2: Comparison of Special Group Children with NCHS Reference Median	147
APPENDIX 3: Precision Estimates	149

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PREFACE

A national nutrition status survey was conducted in the rural and peri-urban areas of Swaziland from September 1983 to January 1984. This period followed a 2-year drought and overlapped with the traditional hunger season. The primary aim of this survey was to provide information on preschool children (0-59 months) with emphasis on the measurement of anthropometric status and feeding practices. Additional information was collected on the sociodemographic, geographic, and health characteristics of the homestead and household. This report consists of survey results that will be useful for program planning and evaluation.

OVERVIEW AND RECOMMENDATIONS

INTRODUCTION

The Swaziland National Nutrition Status Survey was conducted in the rural and peri-urban areas of Swaziland from September 1983 to January 1984. This period followed a 2-year drought and overlapped the traditional hunger season. Following the survey, a 5-day Swaziland Food and Nutrition Workshop (June 17-21, 1985) was conducted to disseminate survey results and identify the most effective interventions and strategies for improving nutritional status within Swaziland.

The survey was planned and carried out by the the Central Statistics Office, Ministries of Agriculture and Health, the National Nutrition Council (Government of Swaziland), and the Centers for Disease Control (United States). Funding for the survey was provided jointly by the Government of Swaziland and USAID.

The purpose of this survey was to (1) provide estimates of the nutritional status of children in Swaziland by using anthropometric indicators, (2) determine factors associated with undernutrition and thus identify children at high risk of undernutrition, and (3) determine where further studies, if needed, would be most productive. It was recognized from the outset that a cross-sectional survey of this nature would be unlikely to establish any cause-and-effect relationships. Nor was the survey designed to assess the prevalence of specific nutritional deficiencies such as pellagra. Such deficiencies are usually too infrequent to be reliably documented in a sample of the size used.

The survey covered the entire country, excluding the urban areas of Mbabane and Manzini. A rural and peri-urban universe were constructed for the survey. In the rural universe, a two-stage population-proportionate sampling method was used to select 125 enumeration areas, and a random process was used to identify the starting homestead within each sample enumeration area. In contrast to the rural universe, which was systematically chosen to be representative of rural Swaziland, the peri-urban universe consisted of four enumeration areas arbitrarily chosen from socioeconomically disadvantaged areas by the National Nutrition Council.

Because of the number of areas covered by this survey, the amount of information collected in any one area was necessarily limited. The major areas examined in this report were those considered to be most directly associated with preschool nutritional status: infant- and child-feeding practices, immunizations, diarrhea and treatment thereof, and mortality among children less than 5 years of age. In addition, some limited information was collected on socioeconomic and demographic characteristics of the homestead.

This report provides a full review of the anthropometric survey findings and a summary of other areas. (A more detailed review of the survey methodology and findings in other areas can be found in the Full Report, Swaziland National Nutrition Status Survey, 1983).

Below are summary findings of the major areas examined. Following each summary is a list of recommendations developed at the Food and Nutrition Workshop.

NUTRITIONAL STATUS

Chronic undernutrition, without concomitant acute undernutrition, was identified as the most common nutritional condition in the Swazi preschool population. Chronic undernutrition as measured by retarded linear growth or "stunting" (height-for-age below -2.00 standard deviations of the NCHS/CDC reference median) was identified in 30.3% of rural children and 23.0% of peri-urban children 3-59 months old. The prevalence of stunting was 12.8% at 3-5 months, which potentially reflects both prenatal and postnatal influences. The prevalence of chronic undernutrition reached its highest levels among children 18-23 months of age and remained high at later ages. (The peak at 18-23 months is probably artifactual because of a change in the reference population). On the other hand, acute undernutrition (wasting), as measured by low weight-for-height (weight-for-height below -2.00 standard deviations of the NCHS/CDC reference median), was identified in only 0.9% of rural and 0.6% of peri-urban children, a prevalence slightly lower than that found in the reference population.

Despite the high prevalence of chronic undernutrition as evidenced by stunting, the level of acute undernutrition was remarkably low. Overall, Swazi children appear to be equal to or somewhat better off nutritionally, as reflected in weight-for-height, than children in other African countries that have been surveyed in the past by using a similar methodology. Thus, the problem appears to require sustained efforts to overcome chronic malnutrition, particularly in the identified high-risk groups.

As has been found in surveys of other developing countries, peri-urban residence was generally associated with a lower prevalence of chronic undernutrition than rural residence. The generally higher socioeconomic level

in the peri-urban area (as measured by education) and availability of resources may account for this. Surprisingly, factors associated with higher levels of stunting were not consistent between rural and peri-urban areas.

No striking regional pattern was observed for district of residence or agro-ecological zone. However, differences were observed by land tenure. The lowest prevalences of stunting were in company towns, followed by Government towns, Individual Tenure Farms, and Swazi Nation Land. After controlling for maternal education, the differences disappeared for children of mothers with no education or adult education only. Within the Swazi Nation Land tenure category, the Rural Development Areas and the non-rural development area had similar prevalences of stunting.

The percentage of stunting was lower among children from homesteads where children use a latrine or toilet. In the rural sample, the percentage was lower for homesteads that usually obtain drinking water from a private tap as compared with a public tap or other sources.

Family characteristics were modestly associated with chronic undernutrition in the rural sample, including previous sibling deaths, larger household size, and maternal non-membership. Older maternal age was associated with higher rates of stunting in infants only. Children whose fathers were uneducated and had several wives were at higher risk of chronic undernutrition than if fathers had only one wife. Marital status had little association with chronic undernutrition. Children of unmarried mothers had about the same rates of stunting as children of married mothers.

Longer travel time to the nearest clinic and nonattendance at maternal child health clinics were modestly associated with chronic undernutrition in the rural sample.

Because of the potential importance of agricultural factors to the availability of food for children, questions on cattle ownership, land cultivation and use, and presence of a vegetable garden were asked.

Homesteads where land was cultivated for homestead use had a higher prevalence of stunting. For homesteads cultivating land, the prevalence of stunting was higher where crops were used only for the homestead as opposed to being sold for cash. Children in homesteads where there was a vegetable garden had a lower prevalence of stunting in the rural, but not the peri-urban sample. Cattle ownership was not associated with stunting. Without more indepth information on food and income distribution within the homestead, general information on land cultivation and use is of limited usefulness in identifying children at high risk. Homestead ownership of cattle apparently may not insure access to milk and meat by the children within the homestead. Cultivation of land for crops may reflect the need for income, and the sale of crops may reflect a crop surplus.

Nutritional Status Discussion Issues: Programmatic

This survey identified linear growth retardation without concomitant wasting. Groups at high risk were identified. Chronic undernutrition may result from a combination of dietary and nondietary factors associated with poverty, including inadequate diet, increased infections (particularly gastroenteritis), and poor health and nutritional status of the mother. To be most effective, programs must address both the likelihood of infection (e.g., through diarrhea control, immunizations) and the quantity and quality of the diet.

The multiplicity of factors associated with growth and their complex interaction necessitate consideration of a variety of interventions. Programs

and institutions in Swaziland having resources that could be used to improve nutritional status will need to be identified. These programs and institutions include government health, agricultural, educational, and economic programs as well as private and voluntary organizations. Once these programs and their resources are identified, it will be important to define the specific information needs of those who make decisions and the mechanisms that would allow these programs to operate most efficiently. Subsequent information gathering or monitoring should be designed to meet the practical needs of these programs.

1. Nutrition should receive consideration in the process of planning programs with resources that could be used to improve nutritional status.

Potential activities that could be conducted within sectors and/or the nutrition council include:

- analysis of the nutritional implications of major Government programs and policies;
- monitoring of the nutritional status of the country and development of guidelines for investigation of factors related to malnutrition;
- service as a clearinghouse for all related information in Swaziland;
- increasing the level of awareness of nutrition activities within different ministries or private organizations.

If these activities are deemed useful to the planning process, the technical capacity of the responsible organization(s) may need to be augmented.

2. Emphasis should be given to prevention and treatment of diseases that contribute to malnutrition, specifically, diarrhea and immunizable diseases (see chapters: "Diarrhea" and "Immunizations").

3. Attention should be given to monitoring the growth of the preschool child by routine weighing and by use of growth cards.
4. An important long-term goal is to increase the adequacy of the Swazi diet for children (see chapter on "Infant and Child Feeding Practices").
Agricultural policies and programs should be examined in relation to their possible nutritional implications and, where possible, specific issues might be examined through more detailed analysis of survey results and other available data. Some of the specific issues that might be considered include the relationship of cashcropping to nutritional status; the activities of home economists; the relationship of home gardens and household economics to the nutritional status of women and children; and specific issues related to marketing of food crops, such as the possible benefits of decentralized milling. However, the survey does not provide sufficient data to support specific recommendations in these areas.
5. Nutrition-related conditions must similarly be approached in a comprehensive manner. These include low birth weight, iron deficiency, and others. Maternal education, pre-natal care, and availability of family planning are important for prevention of these conditions. However, the survey does not provide data to support specific recommendations in these areas.

Nutritional Status Discussion Issues: Data

6. Expansion of the current nutrition data base may be a long-term goal. The current nutrition surveillance system is based on weight-for-age data collected at Maternal Child Health (MCH) clinics. Other possible data sources include tabulation of clinically diagnosed cases of protein energy malnutrition, nutrition-related pediatric hospitalizations, and

nutrition-related deaths. Expansion from the health sector to include a regular flow of information from other sectors (e.g., agriculture and economics, and meteorological information) could be useful in identifying important trends. A review of this surveillance approach in other parts of Africa would help in making a decision about this issue. If a more expanded system would be deemed useful and if the resources (particularly personnel) were available, consideration could be given to expanding the current system.

Further analysis using a multivariable approach would help to determine which factors are independently associated with the outcome of interest. The purpose of this analysis would be to clarify risk factors and to identify variables that may not be etiologic, but which are otherwise associated and which can thus be used for targeting programs. The two most important areas are chronic undernutrition and infant-feeding practices (initiation and duration of breastfeeding and age at supplementation). Methods should be developed that take into account the large design effects arising from the cluster sampling methodology.

1. Although multivariable analysis would help to clarify the relative importance of various factors, it would still identify only association not causal mechanisms. Thus, if establishment of causal mechanisms is deemed important, further indepth studies of homesteads identified at high risk of undernutrition would need to be conducted.

INFANT-FEEDING PRACTICES

Initiation of breastfeeding is very common in Swaziland. Nearly 95% of children in the rural sample and 92% in the peri-urban sample had been breastfed. Duration of breastfeeding was examined by using prevalence of breastfeeding by age of child and mean duration of breastfeeding. Prevalence of breastfeeding dropped gradually over the first 18 months and more rapidly after 18 months of age, with less than 5% of children being breastfed after 2 years. Mean duration of breastfeeding was 15.9 months for rural children and 16.1 months for peri-urban children. In the rural sample, as has been described in other developing countries, mean durations of breastfeeding were lower for children with low birth order, for those whose mothers were working away from the home, and for children from high socioeconomic levels whose mothers had received more education than most other mothers.

In addition, markedly lower durations of breastfeeding were evident among mothers who were not members of the homestead. However, the independent effects of these and other important factors, such as birth interval and pregnancy status, were not examined with multivariate analyses. Peri-urban residence was not associated with a lower mean duration of breastfeeding as in other developing countries. In the peri-urban sample, males were breastfed 1.2 months longer than females, and birth order was positively associated with duration of breastfeeding. Surprisingly, in both samples, the oldest mothers (more than 35 years old) had the lowest durations of breastfeeding. Although the percentage of women initiating breastfeeding in Swaziland is comparable to this percentage in other African countries for which data are available, mean durations of breastfeeding are 1.1 to 8.8 months lower.

Early introduction of non-human milks is common in Swaziland and exclusive breastfeeding is not prolonged. Among infants less than 6 months of age, only 27.9% of rural children and 22.3% of urban children were exclusively breastfeeding. In addition, 14.0% of rural children aged less than 3 months and 16.2% of peri-urban children of the same age were already receiving semi-solid or solid food supplementation. More importantly, 3.9% of rural children aged 6-11 months were not yet receiving solid foods. Health education programs need to focus on these high-risk groups.

Infant-Feeding Discussion Issues: Programmatic

1. Swaziland already has very high rates of breastfeeding initiation. If breastfeeding-promotion programs are undertaken, they need to encourage both initiation and longer duration of breastfeeding. Possible programs to encourage breastfeeding include maternity leave, child care facilities, and health education programs.
2. Artificial feeding of infants may increase the rates of infection and likelihood of mortality. Artificial feeding should be strongly discouraged, particularly in infants at the highest risk of infection. Non-formula milks do not contain complete nutrition for infants and should never be used as the sole source of infant nutrition.
3. Appropriate timing of supplementary foods should be encouraged. The development of locally available, nutritious weaning foods and their use is crucial to the growth of infants.

Infant-Feeding Discussion Issues: Data

4. Data from the Swaziland survey can be used as a baseline to compare prevalences of breastfeeding in future surveys and thus document national trends in breastfeeding in Swaziland. Following trends in breastfeeding

in populations at high risk for poor child health should be a high priority.

5. More detailed analysis of the data collected in this survey would provide very useful information. The relative contributions of factors that appear to be associated with initiation of breastfeeding or the length of time a child is exclusively or partially breastfed could be studied using multivariate techniques.
6. To examine whether any factors that may influence feeding decisions are amenable to change, indepth studies would be needed to study groups who choose not to initiate breastfeeding or who breastfeed for short durations. Examples of factors that may be amenable to change are work status of the mother, whether the mother is a member of the homestead, and availability of family planning (if another pregnancy is not yet desired). Infant-feeding education programs and family planning programs therefore need to be coordinated.

IMMUNIZATIONS

The survey found that 56.4% of rural and 54.1% of peri-urban children from birth-23 months of age had immunization cards. The percentage of children with cards plateaued after 3-5 months of age, implying that children are reached early by the immunization program or not at all. The immunization coverage rates reported in this survey are probably underestimates, since some children without cards or whose cards could not be located were reported to have received one or more immunizations. In fact, about half of rural and 70% of peri-urban children aged birth-23 months who had no cards were reported to have had one or more immunizations.

An area of concern is the relatively large proportion of Swazi children between 12-23 months of age who have not completed the immunization series even though they have immunization cards. About one-fourth of Swazi children with cards fall into this category and represent a failure of the system to follow through on these children once they start on the series.

Among children aged 12-23 months, 30.5% of the rural and 33.7% of the peri-urban sample had cards and were classified as fully immunized. The percentage of fully immunized children by district varied from a high of 35.4% in Manzini to a low of 25.4% in Hhohho. By agro-ecological zone, the percentage fully immunized varied from a high of 33.0% in the Highveld to a low of 27.6% in the Middleveld.

The various land tenure areas varied substantially in immunization coverage status. Land tenure areas with relatively high rates of immunization card possession were generally the same ones having relatively high rates of specific antigen coverage. The maximum Rural Development Areas (RDA) had the highest percentage of children with cards (63.8%) and the second highest percentage with complete coverage (35.0%). The individual tenure farm areas had both the lowest percentage of children with cards (49.3%) and the lowest percentage with a full immunization series (20.6%).

Children whose mothers were homestead members and present at least 50 percent of the time had relatively high rates of full immunization. Peri-urban children from small households (less than five persons) were more likely to be fully immunized than children from larger households. There was no similar association in regard to household size in the rural sample. However, rural children from homesteads containing relatively few preschool

children (less than four) were more likely to be fully immunized than children from homesteads containing more children (four or more).

Rural children who were more than two standard deviations below the reference median in height-for-age (stunted) were slightly less likely to be fully immunized; only 25.7% of stunted children were fully immunized, compared with 32.9% of children who were not stunted.

Rates of full immunization were low for children who had not visited an MCH clinic in the previous year (15.9%) or who had made a visit but whose caretaker could not produce a growth chart (9.6%), compared with those children who had made a visit and had a growth chart (47.0%). Travel time to a clinic, which may reflect proximity to a clinic or ability to obtain transportation, was an important factor in immunization. Children living relatively close to clinics had higher rates of full immunization than those who did not. There was no clear association between parental education levels and children's immunization status.

The distributions of immunization coverage for specific vaccines were not necessarily similar to the distributions of full coverage in the districts and zones. Although Manzini district had the highest percentage of children who were fully immunized, it was the third highest in BCG and second highest in measles coverage. The Highveld had the highest percentage of children who were fully immunized, but had the third highest percentage for both BCG and measles coverage and lowest percentage for BCG coverage.

Immunization Discussion Issues: Programmatic

1. Steps should be taken to improve the immunization coverage of children who attend MCH clinics. According to the survey findings, 15.9% of children who have one or more documented clinic visits have no recorded

immunizations. An additional 37.2% are only partially immunized at the age of 12-23 months. One possible factor could be that many children visiting clinics are not immunized because they are ill at the time of the visit. The World Health Organization has recently re-emphasized that neither malnutrition nor illness is a contraindication to vaccination.

2. Additional steps should be taken to increase the rates of immunization among children who are least likely to be fully immunized. The specific geographic and administrative target groups include children living in Hhohho district, the Middleveld, and the Individual Tenure Farm (ITF) and non-RDA land tenure areas. Other groups that will be more difficult to target include those whose mothers are not members of their homestead or whose mothers are away most of the time, peri-urban children from large households, rural children from homesteads containing many preschool children, and children who are chronically malnourished. To the extent possible, programs should target these children at high risk for not being immunized.
3. The finding that immunization rates plateau after 3-5 months of age suggests the need to improve immunization coverage of older infants and children who have not been immunized early in infancy.
4. Children from homesteads with long travel times to clinics were less likely to be immunized, indicating the need to find ways of reaching more remote areas with immunization.
5. If the cost of a card is a factor in the high proportion of children who did not have immunization cards, serious consideration should be given to providing cards at a reduced charge. This might be accomplished at low cost to the Swazi Government through use of the UNICEF Road to Health

Cards, which have the advantages of encouraging growth monitoring and of providing space for recording both immunization and growth information. It might also be useful to promote the concept among parents that the purchase of an immunization card entitles the child to a full series of immunizations.

Immunization Discussion Issues: Data

6. Future Expanded Program of Immunizations (EPI) investigations might include an indepth review of reasons for vaccine delivery failure. Among the data to be included in future EPI investigations should be information to:
 - (a) Identify reasons for children not getting into the immunization system at all. These reasons might be related to logistics (i.e., clinic distances, availability of mobile immunization teams, etc.), or to parental reluctance to have children immunized (e.g., mother's lack of awareness of the EPI, lack of knowledge of vaccines, fear of vaccine side effects).
 - (b) Identify reasons why children who visit MCH clinics have not been immunized. Reasons may include clinic policies that exclude from immunization children who are ill or obviously malnourished, vaccine shortages, parents' inability to pay for vaccine cards, or clinic policies on age at immunization.
 - (c) Estimate the number of immunized children whose cards could not be located, but whose caretakers claimed vaccination. This would involve efforts to identify the percentage of children without cards who have other evidence of immunization (such as the presence of a BCG scar) and efforts to identify the frequency with which cards are lost.

DIARRHEA

During the two weeks preceding the survey, 16.4% of rural and 14.5% of peri-urban children had diarrhea. The point prevalence of diarrhea (on the day of the interview) was 5.2% in the rural sample and 5.4% in the peri-urban sample. Diarrhea in the rural sample was reported most often in the Lubombo district (22.4%), the Lowveld (22.6%), and the minimum RDA areas (20.7%). In both the rural and peri-urban areas children between the ages of 3 and 35 months had the highest rates of illness. Children older than 11 months of age who were stunted had a higher prevalence of reported diarrhea than those who were not stunted. There was a modest association between lower maternal education levels and higher diarrhea prevalences in the rural areas; this association was not found in the peri-urban areas. Infants 2 months of age or less who were partially breastfed or completely weaned from the breast had a substantially higher rate of diarrhea than those who were exclusively breastfed.

Oral rehydration salts (ORS) were reportedly used to treat diarrhea in 27.4% of the rural and 12.5% of the peri-urban cases. Generally ORS were used most often in the districts, zones, and land tenure areas reporting the highest prevalences of illness. Areas where use of ORS was lowest were Individual Tenure Farms and the peri-urban areas.

Diarrhea Discussion Issues: Programmatic

1. Future programs for diarrhea prevention should especially target the Lubombo district, the Lowveld, and the minimum RDA and company-town land tenure areas where children appear to have modestly or substantially higher rates of illness. Within these areas, children in the 3- to-35- month age groups have the highest rates of diarrhea. Attention

should also be focused on promoting the increased availability and use of oral rehydration salts. The continued promotion of exclusive breastfeeding in the first months of life is an important means of reducing diarrheal illness.

Diarrhea Discussion Issues: Data

2. Future investigations should include information on the prevalence of diarrheal illness and the use of ORS as a primary treatment for diarrheal illness. Although this report has been confined to diarrheal morbidity, another important future focus should be prevention of deaths from diarrheal-related illness.

MORTALITY

Generally, the indirect estimates were higher than the direct estimates. In the rural sample the probability of dying between birth and 1 year of age was estimated at .0577 (57.7/1000) by using direct methods and was .113 (113/1000) using indirect methods; the probability of dying from 1 through 4 years of age was estimated at .0280 (28.0/1000) and .0733 (73.3/1000) respectively. In the peri-urban sample, infant mortality was estimated at .0699 by direct methods and .094 by indirect methods; 1-4 year mortality was estimated at .0188 and .0541 respectively. Comparison of these rates for Swaziland with rates calculated by similar methods for other African countries suggests that Swazi rates are relatively low. However, because of the large discrepancy between direct and indirect estimates of mortality and intrinsic limitations in these methods, these mortality estimates must be interpreted with caution.

SWAZILAND FOOD AND NUTRITION WORKSHOP:

SYNOPSIS OF RECOMMENDED PROJECTS

A 5-day Swaziland Food and Nutrition Workshop (June 17-21, 1985) was conducted to disseminate survey results and identify the most effective interventions and strategies for improving nutritional status within Swaziland. A synopsis of recommended projects is presented below.

Agriculture

Since the GOS is already doing a great deal in this area, the challenge was to find the gaps in present programming and do something about them that would not overly tax an already sizeable financial commitment in this area. For this reason the project proposed in this area attempts to (1) promote improved accessibility to credit and technical assistance to women (who do most of the farming), (2) encourage crop alternatives to maize, (3) foster legume production, (4) teach trench gardening techniques, (5) promote storage facilities built at the homestead level, (6) demonstrate water-harvesting for domestic use and vegetable gardening, (7) create an awareness of the problem's magnitude (chronically malnourished children), (8) motivate families to produce enough food to meet their needs, and (9) promote food preservation in the homestead for "hungry season" use. Other interventions not specifically addressed by projects, but which the workshop considered important enough for further discussion and development included (10) emphasizing use of technology already available at the homestead level (e.g., compost-making), (11) subsidizing the cost of seed to offset the high seasonal start-up costs that constrain production, (12) encouraging community leaders to remove grazing livestock from land used for crops in time for early planting, (13) examining the potential benefits of a national pricing structure for farm

produce, and (14) conducting a review by the GOS of production constraints inherent in current land tenure policies.

Education

In order to promote better nutritional status, the workshop recommended that education could be carried out in several ways: (1) Foster inter-ministerial consensus on the needed messages, their wordings, and their priority. (2) Promote the development of health and nutrition curriculum material for the formal sector and educational/ motivational messages and material reflecting this curriculum for the general public. (3) Develop appropriate dissemination techniques and networks, and get the message across. (4) Provide nutritious midday meals to all preschool and primary schoolchildren.

Health

The primary intervention suggested was (1) to improve general maternal-child health status, infant-feeding practices, child spacing, immunization, and diarrheal disease management through integrated training of health workers at all levels. Though not a listed component of all health projects, (2) concomitant education of the general public was thought to have the next highest potential for positive impact on the national nutritional status. (3) Involving nongovernmental organizations and private voluntary organizations in this effort was a common ingredient to all proposals, as was the (4) monitoring and (5) evaluation of health worker performance after training. (6) It was also agreed that measures stronger than simply encouraging exclusive breastfeeding through the first 3-6 months were needed. These included (7) banning the advertising and promotion of breastmilk substitutes, (8) banning feeding bottles and teats (except by

prescription), (9) ensuring quality control over commercially produced weaning foods, and (10) legislating 3-months' paid maternity leave. Strengthening existing (11) water supply and (12) sanitation programs was viewed as highly important in the light of survey findings. Other issues not addressed by the submitted projects, but deemed important to pursue were: (13) the possible elimination of immunization charge, (14) requiring completed immunizations for entry to preschool and primary school, (15) encouraging private sector involvement in immunization services, and (16) encouraging the integration of curative and preventative services.

Food Assistance

The participants felt that the primary need in this area was to develop a program that would use most effectively the known resources to be contributed by the World Food Programme over the next 3 years in order to promote better national nutrition status. This would mean (1) ensuring that supplemental food reached those who need it most. Consequently, (2) using defined "at risk" criteria for entry into the feeding programme became important, as did (3) improving the programme's ability to identify those at risk as early as possible. (4) Establishing guidelines regarding the quantity, composition, frequency, and duration of food allocated to families, and (5) developing means to minimize the negative effect of food aid were the final interventions necessary to use this finite resource best.

SWAZILAND FOOD AND NUTRITION WORKSHOP:

NEED FOR COMMON SUPPORT

After ensuring consensus, the focus then shifted to interventions previously listed under a fifth general category, that of common support for

all projects. Participants who had finished their project descriptions earlier in the day were asked to focus on the needs reported to the plenary body and make recommendations in two major areas of common support: continued research and surveillance systems. Project recommendations were discussed and the entire workshop finally agreed on specific, limited interventions in each area.

Continued Research

(1) Define the catchment areas of clinics. (2) Assess current infant- and child-feeding practices. (3) Undertake multivariate analysis of survey data in response to identified needs for improved decision-making.

Surveillance System

The single intervention recommended by the workshop was to strengthen the practice of growth monitoring of children under age five, primarily to see the health progress of monitored children and to identify the malnourished child.

SWAZILAND FOOD AND NUTRITION WORKSHOP:

NEED FOR COORDINATION AND CENTRAL SUPPORT

The need for coordination and central support for all projects which impact on Swazi nutritional status was discussed. The first assignment to the entire body was to list legitimate needs for coordination not already provided by the proposed projects. The analogy used was that of a wise executive who felt the need to hire someone new. He would first define the need (be sure about the job tasks to be performed), and satisfy himself that no one in his organization was doing these tasks. He would then proceed to describe the characteristics required to fulfill those tasks well. Only then would he begin to look for the individual possessing them. Consequently,

no theories about who or what a coordinating body might best be were accepted until there was agreement on the needed (not now performed) job tasks that such a body might perform.

The workshop finally did identify legitimate needs for coordination:

- (1) advocacy for and influence in securing approval and support of projects benefitting nutritional status;
- (2) encouragement of institutions implementing nutritionally beneficial projects to implement them as envisioned;
- (3) avoiding duplication;
- (4) stimulating, through the cross-fertilization of ideas from different sectors and organizations, nutritionally beneficial actions that might not otherwise occur;
- (5) collection and dissemination of data relevant to decision-making that affects nutritional status;
- (6) formulation of a national food and nutritional policy;
- (7) advising others on the nutritional effects of various projects, products, and policies;
- (8) initiating and promoting legislation benefiting nutritional status;
- (9) disseminating nutritionally important information to the public.

Every one of these job tasks was deemed to be important and necessary in any serious campaign for a better nutritional status in Swaziland. Moreover, participants were convinced that few of these tasks would be performed without an effective coordinating body.

In order to perform the functions listed above, participants of the workshop decided the needed coordinating body must have the following characteristics: (1) Its work should be guided by high-level technical, professional, and managerial representation from as many ministries and NGOs as possible that influence or impact directly upon nutritional status. (2) It must have full-time, paid staff. (3) It should be centrally located within the government (Prime Minister's Office or Department of Economic

Planning perhaps), so that it can adequately support the work in all ministries. (4) It must be a statutory body.

In summary, the participants felt a coordinating body necessary to effective implementation of a national nutrition strategy, but agreed that much could be done before it became a reality as described.

NUTRITIONAL STATUS

INTRODUCTION

The primary aim of this aspect of the survey was to measure the nutritional status of Swazi children during the season of highest risk--the traditional hunger season from June to November. Because of delays in starting, however, the survey period actually extended from September 1983 to January 1984.

BACKGROUND

Previous Nutrition Studies

Recent data on the nutritional status of Swazi children before this survey were unavailable. The only previous national nutrition survey was conducted in 1962 (Jones, 1963). At that time, the Swazi diet was found to be deficient in calories, calcium, vitamin A, riboflavin, and niacin. The most poorly nourished members of the population were children from the age of weaning to 5 years and pregnant and lactating women. The most deficient diets were in the peri-urban and Lowveld areas.

The Swaziland Rural Homestead Survey conducted by the Economics and Statistics Department of the University College of Swaziland seasonally monitored food consumption/dietary intake for about 100 rural families during June 1978 to May 1979 (Capetta, 1980). The mean per capita calorie intake was barely adequate (2200 kcal). Diets in the Middleveld and Highveld were more adequate than diets in the Lowveld. Households that raised a cash crop (and who did not sell food crops) had better diets than households selling food crops grown. Although diet varied by season (least adequate in the dry

season, June–November), seasonal differences were thought to be diminished compared with earlier years.

Indices of Malnutrition

Anthropometry (measurements of linear growth and body mass) is considered the most practical indicator of the nutritional status of preschool children. However, the use of anthropometric indices depends on the choice of an appropriate reference population and selected cutoff values for defining both acute and chronic undernutrition.

This survey did not collect information on anemia and other manifestations of iron deficiency. This decision was made because data from all parts of the developing and industrialized world indicate that iron deficiency is a ubiquitous and highly prevalent pediatric problem. Efforts to improve the iron content of Swazi children's diet need not await additional data collection and analysis. Collection of hemoglobin and hematocrit data is costly in time and resources. In addition, a concern was raised that local people may not allow blood collection by nonmedical personnel or may attribute subsequent illness or other misfortunes to such a collection.

Reference Values. Since the influence of the environment (e.g., poverty, nutrition and infectious disease) is more important in determining growth than race or genetic factors, the use of an international reference to compare the growth of children from various populations has been generally recommended (Graitcer, 1981; Habicht, 1974). WHO has recommended the NCHS data base (Hamill, 1977; WHO, 1978) for use as an international reference population. Use of such an international reference allows comparison of Swazi data with data from different countries.

The NCHS reference values for the 2- to 5-year age groups are based on a large, representative cross-sectional survey of U.S. children. Most of these children are white, but black children and those of other ethnic groups are also included. The NCHS reference values for children <2 years of age are based on a longitudinal study of upper middle class, almost exclusively white American children. The use of this international reference population, which has been recommended by WHO (World Health Organization, 1978), allows comparison of Swazi data with data from different countries.

Anthropometric Indices. Three indices of physical growth are commonly used to describe the nature and extent of malnutrition in children: weight-for-height (or length), height-for-age, and weight-for-age.

Weight-for-height, or body mass in relation to body length, provides an estimate of recent nutritional status. For the Swaziland survey results, wasting (acute undernutrition) was defined as any weight-for-height value less than 2 standard deviations (SD) below the mean of the reference value ($<-2.00SD$). As with height-for-age, weight-for-age requires an accurate estimation of the child's age for reliable results. Weight-for-height is relatively independent of age and may thus be of greater usefulness in situations where children's exact ages are not known.

Height-for-age is an index of linear growth and reflects past nutritional status. To be useful as an index of stunting or chronic undernutrition, height-for-age requires an accurate estimation of the child's age, which was sometimes difficult to determine in the course of field surveys. Stunting (chronic undernutrition) was defined as height-for-age below 2.00 SD's below the mean. Values below -3.00 SD were defined as severe stunting; values intermediate between -3.00 SD and -2.00 SD were defined as moderate stunting.

Weight-for-age, although commonly used, is a composite index of the other two and does not distinguish between a child who is underweight because of thinness and one who is underweight because of shortness (Gomez, 1956). Children below -2.00 SD below the reference median were categorized as undernourished.

METHODS

Measurements

Each survey child aged 3-59 months was measured for length or stature to the nearest 0.1 cm and for weight to the nearest 0.1 kg. (Children ≤ 2 months old were not measured because length references are unavailable.) A standard portable measuring board and Salter spring scale were used to measure and weigh the children. The presence or absence of edema was determined by firm thumb pressure on the pretibial surface of both legs. Because most reported cases of edema were unilateral, of the nonpitting type, or of unknown severity, this indicator was not felt to be reliable and was not included in the tabulations. Information regarding other signs suggesting protein-calorie malnutrition (such as depigmentation of the hair or skin, straight hair or hair that could be easily plucked from the scalp, paint-flake dermatitis, etc.) was not collected because of the low reliability of such information in predicting protein-energy undernutrition, particularly when evaluated and recorded by inexperienced personnel.

The survey teams were trained in standard weighing and measuring techniques (see Appendix 1). Practice sessions were conducted at the maternal and child health clinic in Mbabane. Standardization exercises were also conducted to quantify and improve the level of accuracy and precision (Habicht, 1972).

Analysis

Data for all anthropometric indices are presented in terms of standard deviation scores in relation to the NCHS/CDC reference median values. This method of presenting anthropometric results has been recommended for international use (Waterlow, 1977). Z-score (standard deviation) values describe the approximate probability distribution of values and thus identify a fixed proportion of the reference population. For the reference population, approximately 15.85% of the children would be expected to fall below -1.00 SD; 2.25%, below -2.00 SD; and 0.15%, below -3.00 SD.

Values more than two standard deviations below the reference mean have been proposed as criteria for undernutrition (Waterlow, 1977) for each of the three anthropometric indices. The analysis of survey data was directed towards estimation of the levels of undernutrition and associated factors. These factors possibly associated were cross-tabulated against various nutritional categories.

An alternative method used in many studies is a comparison of observed prevalences below selected arithmetic percentages of the reference median value (percent of median). Percent of median, by definition, has a fixed relation to the median at all values of a given measurement, but percent-of-median value may not correspond to the same percentile rank at different ages or for different indicators (Waterlow, 1977). To facilitate comparison with other survey data, prevalences of low values of the three anthropometric indices (using percent-of-median cutoff), will be presented briefly after presentation by Z-scores. (See "Presentation of Data Using Percents of Median" in this chapter.)

Data from Swaziland will be compared with other countries following in the section entitled "Comparison of Swaziland Survey with Other African Surveys."

Anthropometric Editing Criteria

To exclude extreme values representing probable measurement errors, all records that met the following anthropometric criteria were excluded from the anthropometric analyses:

Height-for-age ≥ 6 SD's from the median in either direction.

Weight-for-age ≥ 6 SD's from the median in either direction.

Weight-for-height ≥ 6 SD's above or < 4 SD's below the median.

Records that exceeded 3.09 SD's for both weight-for-height and height-for-age in opposite directions were excluded on the basis of probable height errors.

RESULTS

In the tabulations below, data are first presented for the rural sample and then for the peri-urban sample. Where the numbers in the peri-urban sample are too small for disaggregation or where tabulations are not useful, tabulations are not provided.

Response Rate

Of the 4,432 children between the ages of 3 and 59 months eligible for the rural sample, 4133 (93.2%) were included in the analysis of anthropometric results. Of the remaining number, 41 (.9%) were excluded on the basis of probable measurement error; and 258 were excluded (5.8%) either because the child was absent or the parents refused to cooperate.

Of the 704 age-eligible children from the peri-urban sample, 658 (93.5%) were included in the analysis of anthropometric results. Of the remaining,

5 (0.7%) were excluded on the basis of probable measurement error; and 41 were excluded (5.8%) because of absence or parental refusal.

Anthropometric Z-Scores: Height-for-Age

To examine factors associated with chronic undernutrition, the prevalence of stunting (below -2.00 standard deviations from the median) was cross-tabulated with enumeration area, homestead, household, maternal and paternal factors, utilization of medical care and infant feeding. The following discussion describes the relationship of these factors to the prevalence of stunting.

Rural Versus Peri-Urban. The overall percentage of stunting was significantly higher in rural areas (30.3%, 95% confidence intervals = 28.0%-32.6%) than in peri-urban areas (23.0%) (Table 3). Figure 1 shows the height-for-age distribution of the rural, peri-urban, and NCHS/CDC reference populations. The distribution of height-for-age Z-scores is shown in Tables 1 and 2.

Age. In the rural areas, the rates of stunting were lowest in younger age categories: 12.9% at 3-5 months and 16.9% at 6-11 months. The rates peaked in the 18- to 23-month age category at 41.7% and decreased in the older age categories ranging from 29.6% to 34.3% (Table 3). The difference between the prevalences in the 18- to 23-month age category and 24- 29-months age group may be, in part, artifactual because of the change in the reference population at 24 months (Table 3).

In peri-urban areas, stunting rates followed the same age pattern as in rural areas, but were consistently 6%-10% lower (Table 4).

Sex. In the rural sample, the overall rates of stunting were about the same for males (32.0%) and females (28.7%). However, males have lower rates

of stunting than females at 3-5 months (7.6% versus 18.4%) (Table 3).

At 6-11 and 12-17 months, males have higher rates of stunting than females (21.3% versus 12.8% and 37.9% versus 22.7% respectively). At 18-23, 24-35, and 36-47 months, the rates of stunting are approximately the same for males and females. At 48-59 months, males have a higher rate of stunting (37.2% versus 30.3%).

In the peri-urban areas, males have a slightly higher overall rate of stunting (25.7%) than females (20.0%) and maintain slightly higher rates in all age categories (Table 4).

Characteristics of Enumeration Area (Zone, Land Tenure, District)

Agroecological Zone. In the rural sample, the percentage stunted were similar by agroecological zone (Table 5): Highveld (30.0%), Middleveld (31.7%), Lowveld (28.1%), and Lubombo (34.8%).

Land Tenure. In the rural sample, the percentage stunted varied by land tenure: company town (21.0%), administrative (25.0%), individual tenure farm (28.6%), Swazi Nation land non-Rural Development Area (RDA) (34.0%), minimum RDA (31.2%), and maximum RDA (30.9%) (Table 6).

Because the level of maternal education was higher for the company and administrative towns, the percentage stunted was examined by both maternal education and land tenure (Table 7). After stratification for maternal educational level, the differences in stunting by tenure disappeared for children of mothers with no education or adult education only. At higher maternal education levels, the company towns maintained a lower percentage of stunting compared with other groups. For children whose mothers were at the education level of grade 1-standard 5, 20.5% in company towns were stunted, compared with 31.9% in Swazi Nation land, 28.4% in individual tenure farms,

and 28.1% in administrative towns. For children whose mothers were at the educational level of form 1-University, 12.5% in company towns were stunted, compared with 22.8% in Swazi Nation land, 22.6% in Administrative towns, and 20.0% in individual tenure farms.

When stratified for age of the child, the differences in stunting by land tenure diminished for the older age groups (Table 8).

District. In the rural sample, the percentage stunted did not vary significantly by district (Table 9).

Homestead/Household Characteristics.

Possessions Owned by Homestead. For members in the rural sample, ownership of possessions by homestead members was generally associated with a lower than average percentage of stunting (Table 10). The prevalence of stunting was lower in homesteads that owned the following items as compared with those that did not: working refrigerator, vehicle, stove, tractor, sewing machine, radio and spring bed. Ownership of a maize milling machine was not associated with a lower prevalence of stunting.

In the peri-urban sample, there was no relationship between the prevalence of stunting and ownership of most of these items (Table 11). However, ownership of a car or truck was associated with a lower prevalence of stunting: 19.6% of children from homesteads owning a vehicle (car or truck) were of short stature compared with 24.1% for homesteads not owning a vehicle.

Highest Level of Education Within the Homestead. In the rural sample, prevalence of stunting was inversely associated with the highest educational level achieved within the homestead: university (17.7%), forms 1-6 (27.4%), standards 1-5 (33.3%), grades 1-2 (40.4%), and none/adult education (44.3%) (Table 12).

In the peri-urban areas, the differences were less consistent: university (23.0%), forms 1-6 (22.1%), and standards 1-5 (27.3%). Below standards 1-5, the numbers were too small for calculation (Table 13).

Cattle Ownership by Homestead. In the rural sample, the percentage of children with either moderate or severe stunting did not vary by homestead ownership of cattle (Table 14). A consistent relationship did not appear after stratification for education of the mother or land tenure.

Land Cultivation by Homestead. In rural areas, a higher percentage of children were stunted in homesteads where land was cultivated for homestead use (31.7%) than in homesteads where land was not cultivated for homestead use (21.0%) (Table 15). This relationship persisted after stratification for education. A similar pattern was seen in peri-urban homesteads (Table 16).

Homestead Vegetable Garden. In the rural samples, the overall percentage of stunting was somewhat higher for homesteads without a vegetable garden (32.4%) than for those with a vegetable garden (27.2%) (Table 15). Also, in the rural sample, the relationship of stunting to presence of a vegetable garden varied by education of the mother (Table 17).

Use and Cultivation of Crops. For homesteads that cultivated crops, the percentage distribution of height-for-age by type and use of crop cultivated is shown in Table 18. Most homesteads grew crops (maize, pumpkins, jugo beans, sweet potatoes/yams, sorghum, and tobacco) for homestead use only. Because of the small number of homesteads that grew crops for purposes other than homestead use, an examination of the relationship between percentage stunted and homestead use of crops was possible for only maize and jugo beans. For both these crops, the percentage stunted was lower in homesteads where half or more of the crop was sold for cash. Although the numbers from

homesteads that grew maize as a cash crop were small, this relationship persisted after stratification for maternal education (Table 19). The percentage stunted varied little by type of crop grown and by homestead use of the crop.

Main source of homestead income. In the rural sample, children of homesteads where the main source of homestead income was "agriculture/self-employed" had a higher percentage of stunting (33.9%) than for all other categories (Table 20). Main sources of homestead income for the peri-urban areas are shown in Table 21.

Sanitation Facilities. In rural areas children from homesteads where children usually defecate in the open or in the bush had higher rates of stunting (34.5%) than children who use a wooden latrine (24.1%), concrete latrine (16.5%), or flush toilet (15.2%) (Table 22).

A similar relationship was seen in the peri-urban areas (Table 23).

Source of Water for the Homestead. In rural areas the percentage of stunting varied by the usual water source for the homestead (Table 24). The lowest percentage of stunting occurred in homesteads that usually obtained water from a private tap (15.8%), followed by public tap (26.3%), and by dam or pond water (28.9%). Other major sources of water ranged from well/bore hole (30.6%) to river/stream (33.7%).

In peri-urban areas, the lowest percentage of stunting occurred in homesteads that usually obtained water from a private tap (10.1%), followed by a river/stream (18.7%) and by public tap (26.5%) (Table 25). The small number of children make the percentages statistically unreliable in the other categories.

Because water source and sanitation facilities are interrelated, both were cross-tabulated against prevalence of stunting (Table 26). Prevalence of stunting was low for children with private tap regardless of sanitation facilities. For children with other sources of water, the prevalence of stunting was higher where children usually use the open bush compared with children who use a latrine or toilet. Because sanitation facilities may also be related to educational levels, sanitation facilities and maternal education levels were also cross-tabulated (Table 27). Generally within each educational level, lower prevalence of stunting was seen for children using a latrine or toilet.

Homestead/Household Size. In the rural sample, the percentage of children stunted did not vary consistently or greatly by number of persons per homestead or household or by number of persons <5 years of age per homestead. Although there appeared to be a slight trend for increasing stunting in homesteads of fewer than 5 to 15-19 persons per homestead/household, the trend reversed and percentages of stunted dropped in households of 20+ persons (Table 28). Similarly, no consistent relationship was seen for number of persons <5 years old per homestead (Table 29).

No consistent relationship between stunting and homestead/household size was seen in the peri-urban sample (Tables 30 and 31).

Maternal Characteristics.

Membership and Residence Status. In the rural sample, the lowest percentage of stunting occurred among children whose mothers were members of the homestead but who were present <50% of the time (25.4%), compared with the percentage stunted for children of mothers who were present at least 50% of the time (29.9%) or who were not a member of the homestead (34.2%) (Table 32).

In the peri-urban sample, a lower percentage of stunting occurred among children whose mothers were members and present at least 50% of the time (22.2%), as compared with the percentage stunted for children of mothers who were not a member of the homestead (28.8%) (Table 33).

Employment Status. Similarly in the rural sample, the lowest percentage of stunting occurred among children whose mothers worked away from home (21.8%), compared with the percentage for mothers who worked at home (26.7) or mothers who did not work (31.5%) (Table 34). These associations were maintained after stratification for maternal membership/residence in the homestead and mother's employment status (Table 35).

In contrast, in the peri-urban sample the lowest percentage of stunting occurred among children whose mothers were employed inside the home (14.4%), compared with mothers who worked outside the home (25.4%) or who were unemployed (23.7%) (Table 36).

Occupation of the Mother. In the rural sample, in which mothers were members of the homestead, the percentage of stunted children ranged from 35.0% for farmers to 14.2% for salaried government workers (Table 37). In the peri-urban sample, the percentage of stunted children varied little (Table 38).

Maternal Education. In rural areas increasing maternal education was associated with a lower overall prevalence of stunting (Table 39). A similar pattern was noted in the peri-urban areas (Table 40). Interestingly, the percentage of stunting after stratification by maternal education was approximately the same for rural and peri-urban areas.

Maternal Age. In the rural sample, less stunting was found among the children of mothers <35 years of age. Among mothers <20 years old, this percentage was 27.1%; for 20- to 24-year-olds, 28.8%; 25- to 29-year-olds, 29.9%;

30- to 34-year-olds, 27.9%; 35- to 39-year-olds, 32.8%; and among mothers 39 years old, 32.4% (Table 41). After stratification by child's age, the difference was seen primarily for children <12 months old (Table 42).

No consistent pattern was noted in the peri-urban areas (Table 43).

Birth Order of Living Children. In the rural sample, children of mothers who had fewer than 4 living children had a lower percentage of both overall and severe stunting (birth order one, 25.2%; two to three, 28.9%) than children of mothers who had borne more (Table 44). Children whose mothers had at least 8 living children had the highest percentage of severe stunting (14.1%) compared with other children.

Because a child's age and birth order of living children were correlated, the percentage stunted was cross-tabulated by child's age and birth order (Table 45). However, the trend toward lower percentage of stunting among children whose mothers had ≤ 3 living children was not consistent within all age categories.

A similar pattern was found in the peri-urban sample (Table 46).

Sibling Deaths. In the rural sample, the prevalence of stunting increased slightly with the number of siblings who had died (Table 47). In the rural sample, 28.0% of children who had no dead siblings were stunted, compared with 30.9% of children with one dead sibling, 34.4% with two or more dead siblings, and 36.1% with three or more dead siblings. The percentage of severe stunting increased with number of sibling deaths from 8.0% for children who had no dead siblings to 17.6% for children with three or more dead siblings.

In the peri-urban sample, the prevalence of stunting did not vary consistently with the number of siblings who had died (Table 48).

Marital Status. In both the rural and peri-urban samples, the prevalence of stunting was similar for the children of mothers who were married compared with the percentage for children of mothers who were not married or who were divorced (Tables 49 and 50).

Paternal Characteristics.

Membership and Residence Status. In the rural sample, the percentage of stunting did not vary by the father's membership or residence status (Table 51). In the peri-urban areas, stunting was 13.4% among children whose fathers were members of the homestead but present <50% of the time, compared to children whose fathers were members but present \geq 50% of the time (22.8%) and children whose fathers were not members 24.9% (Table 52).

Education of the Father. For those fathers who were members of the homestead in the rural sample, the percentage of both severely and moderately stunted children increased with decreasing paternal education: university 5.9%; grade 1 to standard 5, 29.3%; adult education only, 37.7%; and none, 36.2% (Table 53). A similar trend was apparent in the peri-urban areas, but the numbers were small (Table 54).

Marital Status and Number of Wives. In the rural sample, for those children whose mothers were married, the prevalence of stunted children increased with the number of the father's wives: 29.5% if the father had one wife; 32.8%, two wives; 35.6%, three wives; and 41.2%, four or more wives (Table 55). After stratification of paternal education, the association between increasing number of wives and increasing percentage of stunting remained for children of fathers with no education or adult education only (Table 56). In the peri-urban areas, the number of fathers with more than one wife was too small for comparison.

Occupation of the Father. In the rural sample where fathers were members of one homestead, the percentage of stunted children ranged from 39.2% for sellers or hawkers to 25.8% for salaried government workers (Table 57). The percentage of stunted children was 36.4% for farmers. In the peri-urban sample, most of these were salaried workers (Table 58). The low percentage of farmers in the rural sample (8.9%) and the low percentage of unemployment in both the rural (10.9%) and the peri-urban sample (3.9%) may indicate inaccuracy in these self-reported occupational categories.

Utilization of Medical Care.

Travel Time To Clinic. The percentage of children stunted rose with increasing travel time to the nearest health clinic (Table 59).

Attendance at Maternal Child Health Clinics. Children who had ever attended a maternal-child health (MCH) clinic were compared with those who had not. In both rural and peri-urban areas for all age groups combined, the percentages of both severe and moderate stunting were consistently lower for children who had ever attended such a clinic (Table 60 and 62). Because both the likelihood of clinic attendance and prevalence of stunting were strongly associated with age of the child, clinic attendance and height-for-age were cross-tabulated by the child's age for the rural sample (Table 61).

Method of Infant Feeding. No clear relationship between current method of infant feeding and percentage of stunting emerged. The small number of children exclusively breastfed or weaned from the breast prohibited comparison by feeding method after 3-5 months of age. At 6-11, 12-17, and 18-23 months of age, the children weaned from the breast had a lower percentage of stunting (Table 63).

Anthropometric Z-Scores: Weight-for-Height

Rural Versus Peri-Urban. The overall percentage of wasting was similar to that in the reference population: 0.9% of rural children (95% confidence interval = 1.2%–0.5%) and 0.6% of peri-urban children. The distribution of weight-for-height Z-scores is shown in Tables 64 and 65.

Age-Sex. The prevalence of wasting varied somewhat by age and sex, as shown in Tables 66 and 67, but because of low prevalences, these differences have little practical meaning. The weight-for-height distribution shows little variation by sex.

Zone, Tenure, District. The prevalence of wasting varied somewhat by district/agroecological zone and by administrative area; however, this variation in prevalence is not meaningful because of low prevalences of wasting (Tables 68 – 70).

Other Factors. Because the prevalence of wasting was generally equal to or lower than expected compared with the prevalence of wasting for the reference population, comparisons of wasting with other factors were not performed.

Anthropometric Z-Scores: Weight-for-Age

Rural Versus Peri-Urban. The overall percentage of underweight was similar in the rural (9.8%) (95% confidence interval = 10.9% –8.6%) and the peri-urban sample (8.2%) shown in Tables 73 and 74. The distribution of weight-for-age Z-scores is shown in Tables 71 and 72.

Age-Sex. In rural areas percentages of underweight children were lowest in younger age categories: 2.8% at 3–5 months and 7.4% at 6–11 months. The percentage peaked at 12.9% in the 18- to 23-month age category and leveled off at 8.8% to 10.7% for the older age categories (Table 73). The peak in

the 18- to 23-month age category may be artifactual because of the change in the reference population at 24 months. Overall, the percentage underweight was only slightly higher for males (10.8%) than for females (8.8%).

In the peri-urban areas, percentage of children underweight follow the same age-sex pattern as in the rural areas (Table 74).

Zone, Tenure, District. The percentage of underweight did not vary significantly by zone, tenure, or district (Tables 75 - 77).

Other Factors. Because weight-for-age is a composite index reflecting both long-term and recent nutritional status, examination of factors associated with low weight-for-age is unlikely to provide useful information beyond that provided by examination of height-for-age and weight-for-height for height results. However, because the current Ministry of Health nutrition surveillance system is based on the weight-for-age index, weight-for-age by attendance at the maternal-child health clinics was tabulated in relation to this indicator.

Attendance at Maternal-Child Health Clinics

For the combined rural sample, the percentage of children who were underweight was slightly lower for children who had ever attended an MCH clinic compared with those who had not (Table 78). Similar findings were seen for the peri-urban sample (Table 80). Because both the likelihood of clinic attendance and prevalence of underweight were associated with age of child, clinic attendance and prevalence of underweight were cross-tabulated by child's age (Table 79). At 0-11 months, the difference in percentage of children underweight who had a history of attendance versus those who did not was 2.3%; at 12-23 months, 8.2%; and at 24-59 months, 4.0% (Table 79).

Presentation of Data Using Percents of Median

To allow comparison with previous nutrition surveys, some of which have used percent-of-median cutoffs rather than Z-scores, comparable prevalences were presented by these two methods of tabulation (Table 81). The following commonly used percent-of-median levels are presented: 90% of median height-for-age, 80% of median weight-for-height, and 80% of median weight-for-age.

The prevalences of undernutrition as determined by these percent-of-median cutoffs for height-for-age and weight-for-height cutoffs are considerably lower than those determined by the -2.0 SD cutoff level. For the indices of height-for-age and weight-for-height, the standard deviation cutoff of <-2.5 SD's yields approximately equivalent prevalence rates for the percent-of-median cutoffs used. For the index weight-for-age, the standard deviation equivalent value lies slightly above the -2.0 SD cutoff.

COMPARISON OF SWAZILAND SURVEY WITH OTHER AFRICAN SURVEYS

For comparison purposes, prevalence rates of undernutrition in previous USAID-funded African national nutrition status surveys conducted by the Centers for Disease Control or the University of California, Los Angeles, are presented in Tables 82 - 85. The comparison rates presented here are adapted from Tables prepared by the Food Policy and Nutrition Division, FAO, UN.

Swaziland had the lowest percentage of children with stunting, wasting and underweight of all the African countries surveyed (Table 85). As in other African countries, rural children in Swaziland had higher prevalences of stunting, wasting and underweight than peri-urban children (Table 85).

Patterns of stunting and wasting followed the same age pattern as in other countries: the percentage of stunting was higher after age 6-11 months with some leveling after children reached 3 years of age (Table 84). Wasting decreased with age after 6-11 months of age in Swaziland, similar to the trend in Lesotho and Egypt (Table 85). For other countries, the percentage of wasting peaked at 12-23 months of age. The prevalence of wasting was generally lower in all countries in children older than 24 months of age.

DISCUSSION

The purpose of this survey was to (1) provide estimates of the nutritional status of children in Swaziland by using anthropometric indicators, (2) determine factors associated with undernutrition and thus identify children at high risk of undernutrition, and (3) determine where further studies, if needed, would be most productive. It was recognized from the outset that a cross-sectional survey of this nature would be unlikely to establish any cause-and-effect relationships. Nor was the survey designed to assess the prevalence of specific nutrient deficiencies such as pellagra. Such deficiencies are usually too infrequent to be reliably documented in the size of sample used.

The survey does assess the prevalence of protein-calorie malnutrition as reflected in the growth of children. In this regard, the finding of low prevalence of acute undernutrition (wasting) was impressive and unexpected because the survey was conducted after a 2-year drought during which time food supplies were lower than in previous years. However, the survey may not have been conducted when food supplies were at their absolute lowest level since the survey only partially overlapped a season when food is typically scarce.

Moreover, although diarrheal diseases can cause substantial loss in body weight in a short time, the survey was conducted during the season when rates of diarrhea are usually low; thus, the rates of wasting due to diarrheal illness would be expected to be low.

The survey revealed evidence of chronic undernutrition as measured by short stature in Swazi preschool children. The prevalence of stunting at 3-5 months (12.9) may reflect both prenatal and postnatal influences. The prevalence of stunting reached its highest levels among children 18-23 months of age and remained high at later ages. (The peak at 18-23 months may be, in part, artifactual because of changes in the reference population at 24 months.) The increased prevalence of stunting among the older children is consistent with the pattern in other developing countries. This pattern may be caused by inadequate weaning practices and the higher incidence of infectious diseases among children beyond infancy (Seward, 1984).

As has been found in surveys of other developing countries, peri-urban residence was generally associated with a lower prevalence of chronic undernutrition. Socioeconomic factors and availability of resources may account for this. The percentage stunted was approximately the same for rural and peri-urban children after controlling for maternal education. Interestingly, factors associated with higher levels of stunting were not consistent between rural and peri-urban areas.

No striking regional pattern was observed for agroecological zone or district. However, differences among land tenures were observed. The lowest prevalences of stunting were in the company towns, followed by administrative towns, individual tenure farms, and Swazi Nation land. After controlling for maternal education, the differences in percentage stunted disappeared for

children of mothers with no education or adult education only. In company towns, percentages of stunting were lower for children of mothers with at least a grade 1 education than for children of mothers with less education.

Many variables used in this survey serve as surrogates for socioeconomic status--educational level of the parents, homestead possessions, and sanitation. As expected, a negative association was found between prevalence of stunting and socioeconomic level. The highest prevalences of stunting were found in homesteads where homestead members had no education or adult education only; those without latrines or toilets; and those lacking homestead possessions, such as a spring bed, radio, etc.

The mechanisms by which socioeconomic status affects nutritional status remain unclear. For example, whether improved nutritional status associated with higher parental education results from increased knowledge and parental awareness of health, or from an ability to purchase more food, and/or from better housing and sanitation cannot be directly determined from the present analysis. Multivariate analysis might clarify the relative importance of various factors, but still would identify only association, not causal mechanisms.

The percentage of stunting was lower among children from homesteads where children usually use a latrine or toilet than where children do not use sanitation facilities. Several possibilities for this relationship exist. Sanitation facilities may lead to lower rates of contamination and hence infection. Another possibility is that homesteads possessing such facilities may practice other good sanitation and health habits.

The presence of both parents in the homestead and their marital status had a modest association with chronic undernutrition. Children of unmarried

mothers had about the same rates of stunting as married mothers. When children whose fathers were members of the homestead were compared with those whose fathers were not, the prevalence of stunting was about the same, regardless of residence status in the rural sample. In the peri-urban sample, children in homesteads where the father was a member but resided less than 50% of the time had lower rates of stunting. Maternal membership was associated with a slightly lower rate of stunting. In the rural sample, children of mothers who were members but resided less than 50% of the time had the lowest prevalence of stunting compared with children whose mothers were in other categories of residence status.

In the rural sample, several other family characteristics were associated with slightly higher levels of stunting: birth order of living children (≥ 4), and death of siblings. Older maternal age (35+) was associated with a higher rate of stunting for infants. Children whose mothers who were married and whose fathers were uneducated and had more than one wife were at higher risk of chronic undernutrition than if their fathers had only one wife.

Because of the potential importance of agricultural factors to the availability of food for children, several questions on cattle ownership, land use, and main source of homestead income were asked. Except for the possible exception of main source of homestead income, none of these variables appear to be risk factors for stunting. In the rural sample, children in homesteads where the main source of homestead income was "agriculture/self employed" had a higher percentage of stunting than other categories. Similarly, where fathers were members of the homestead, the percentage of stunted children was slightly higher for farmers than most other categories. However, the low percentage of farmers in the rural sample and the low percentage of

unemployment in both the rural and peri-urban sample may indicate inaccuracy in these self-reported occupational categories. Without more in-depth information on food and income distribution within the homestead, general information on land cultivation and use is of limited usefulness in identifying children at high risk. Homestead ownership of cattle apparently does not insure access to milk and meat by the children within the homestead. Cultivation of land for crops may reflect the need for income, and the sale of crops may reflect a crop surplus.

The inability to detect an association between infant feeding and attained height in this survey does not imply that an association does not exist. The effect that early termination of breastfeeding and/or introduction of alternative foods (any food other than breast milk) have on infant nutritional status depends on many factors. The most important of these are (1) adequacy of the alternative food compared with breast milk, (2) effect of introducing other foods on breast milk production, and (3) effect of infection on nutritional status and growth. Because of the relatively small numbers of children exclusively breastfeeding at 3-5 months of age and the confounding of method of feeding by socioeconomic status, this area requires further analysis. Previous studies in developing countries that have included adequate numbers of children have clearly demonstrated that breastfed infants have better growth than bottlefed infants in the first months of life (Seward, 1984). (For further discussion, see chapter 5, "Feeding Practices of Infants and Children.")

Travel time to the nearest clinic reflects distance to the clinic, ability to obtain transport, and remoteness of rural residence. Thus, the association between travel time and stunting may reflect many factors. Similarly, the

prevalence of stunting was lower among children who had visited an MCH clinic than among those who had not. Whether this represents an effect of clinic attendance or of increased health awareness or both cannot be determined.

The current nutrition surveillance system is based on weight-for-age data collected at MCH clinics. These data suggest that children who attend the clinics are less likely to be underweight. However, the relationship between stunting and clinic attendance may be due to many factors other than clinic attendance per se.

This survey identified linear growth retardation without concomitant wasting in the Swazi population. This pattern has recently been identified in several countries: Egypt, Israel, Bolivia (Brink, 1983; Dagan, 1983; Administrative of Bolivia, 1981). The reasons for this pattern are unclear and may vary between populations. Linear growth is a complex process affected directly or indirectly by numerous factors including the quality and energy content of the diet, infections, the health and nutritional status of the mother, and general socioeconomic status. These factors probably affect growth through inadequate dietary intake, increased infection, or both. The association of so many dietary and nondietary factors with growth complicates potential intervention programs. To be most effective, programs must address both the likelihood of infection (e.g., diarrhea control, immunizations) and the quality of the diet.

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Table 1
 Percentage Distribution of Height-for-Age
 For Children 3-23 Months of Age
 Swaziland National Nutrition Status Survey, 1983

<u>Height-for-Age Standard Deviation</u>	<u>Rural (n = 1600)</u>		<u>Peri-Urban (n = 270)</u>	
	<u>Percent</u>	<u>Cumulative Percent</u>	<u>Percent</u>	<u>Cumulative Percent</u>
Under -3.50	4.0	4.0	3.7	3.7
-3.50 to -3.01	3.8	7.8	1.9	5.6
-3.00 to -2.51	7.6	15.4	5.6	11.2
-2.50 to -2.01	11.8	27.2	7.8	19.0
-2.00 to -1.51	14.8	42.0	14.8	33.8
-1.50 to -1.01	15.6	57.6	14.1	47.9
-1.00 to -0.51	14.3	71.9	14.4	62.3
-0.50 to -0.01	10.8	82.7	18.1	80.4
+0.00 to +0.50	6.5	89.2	8.5	88.9
+0.51 to +1.00	4.6	93.8	3.3	92.2
+1.01 to +1.50	2.1	95.9	3.3	95.5
+1.51 to +2.00	0.8	96.7	0.4	95.9
+2.01 or more	3.3	100.0	4.1	100.0

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

Table 2
 Percentage Distribution of Height-for-Age
 For Children 24-59 Months of Age
 Swaziland National Nutrition Status Survey, 1983

<u>Height-for-Age Standard Deviation</u>	<u>Rural (n = 2533)</u>		<u>Peri-Urban (n = 388)</u>	
	<u>Percent</u>	<u>Cumulative Percent</u>	<u>Percent</u>	<u>Cumulative Percent</u>
Under -3.50	6.8	6.8	4.6	4.6
-3.50 to -3.01	4.7	11.5	4.6	9.2
-3.00 to -2.51	8.0	19.5	5.4	14.6
-2.50 to -2.01	12.8	32.3	11.1	25.7
-2.00 to -1.51	14.9	47.2	15.5	41.2
-1.50 to -1.01	17.1	64.3	18.0	59.2
-1.00 to -0.51	13.2	77.5	16.2	75.4
-0.50 to -0.01	10.1	87.6	12.9	88.3
+0.00 to +0.50	5.2	92.8	5.2	93.5
+0.51 to +1.00	3.0	95.8	3.4	96.9
+1.01 to +1.50	1.9	97.7	1.5	98.4
+1.51 to +2.00	0.9	98.6	0.3	98.7
+2.01 or more	1.4	100.0	1.3	100.0

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

Table 3
 Percentage Distribution of Height-for-Age
 By Age and Sex
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Months of Age</u>	<u>Sex</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
		<u>Stunting</u>			
		<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>>=-2.00</u>	
3-5	Male	1.2%	6.4%	92.4%	(110)
	Female	4.4%	14.0%	81.5%	(107)
	Total	2.8%	10.1%	87.1%	(217)
6-11	Male	3.9%	17.4%	78.7%	(221)
	Female	1.5%	11.3%	87.2%	(237)
	Total	2.7%	14.2%	83.2%	(458)
12-17	Male	11.0%	26.9%	62.2%	(269)
	Female	3.2%	19.5%	77.3%	(240)
	Total	7.2%	23.3%	69.5%	(509)
18-23	Male	17.9%	25.2%	56.9%	(204)
	Female	15.3%	25.1%	59.7%	(212)
	Total	16.6%	25.1%	58.3%	(416)
24-35	Male	9.8%	19.1%	71.1%	(466)
	Female	11.3%	18.9%	69.7%	(462)
	Total	10.6%	19.0%	70.4%	(928)
36-47	Male	12.1%	22.3%	65.6%	(442)
	Female	11.7%	22.5%	65.8%	(446)
	Total	11.9%	22.4%	65.7%	(888)
48-59	Male	16.2%	21.0%	62.8%	(325)
	Female	8.6%	21.7%	69.7%	(392)
	Total	12.1%	21.4%	66.6%	(717)
Total	Male	11.2%	20.8%	67.9%	(2037)
	Female	8.9%	19.8%	71.4%	(2096)
	Total	10.0%	20.3%	69.7%	(4133)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.

Table 4
 Percentage Distribution of Height-for-Age
 By Age and Sex
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

Months of Age		Height-for-Age Z-Score			Number
		Stunting			
		Severe <-3.00	Moderate -3.00 to -2.00	≥-2.00	
3-5	Male	--	--	--	(17) ⁺
	Female	--	--	--	(14) ⁺
	Total	--	3.2%	96.8%	(31) ⁺
6-11	Male	--	10.3%	89.7%	(39) ⁺
	Female	2.2%	2.2%	95.7%	(46) ⁺
	Total	1.2%	5.9%	92.9%	(85)
12-17	Male	2.7%	21.6%	75.7%	(37) ⁺
	Female	--	18.9%	81.1%	(37) ⁺
	Total	1.4%	20.3%	78.4%	(74)
18-23	Male	23.9%	15.2%	60.9%	(46) ⁺
	Female	5.9%	23.5%	70.6%	(34) ⁺
	Total	16.2%	18.8%	65.0%	(80)
24-35	Male	7.6%	19.7%	72.7%	(66)
	Female	6.3%	14.3%	79.4%	(63)
	Total	7.0%	17.1%	76.0%	(129)
36-47	Male	6.7%	22.7%	70.7%	(75)
	Female	17.1%	8.6%	74.3%	(70)
	Total	11.7%	15.9%	72.4%	(145)
48-59	Male	6.9%	20.7%	72.4%	(58)
	Female	10.7%	12.5%	76.8%	(56)
	Total	8.8%	16.7%	74.6%	(114)
Total	Male	7.7%	18.0%	74.3%	(338)
	Female	7.8%	12.2%	80.0%	(320)
	Total	7.8%	15.2%	77.1%	(658)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.

⁺A number <50 is considered statistically unreliable. percentages are not provided for any number <20.

Table 5
 Percentage Distribution of Height-for-Age
 By Agroecological Zone
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Highveld	10.5%	19.5%	70.0%	(1108)
Middleveld	10.4%	21.3%	68.3%	(1603)
Lowveld	8.9%	19.2%	71.9%	(1226)
Lubombo	10.7%	24.1%	65.1%	(196)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.

Table 6
 Percentage Distribution of Height-for-Age
 By Land Tenure
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Swazi Nation Land				
Non-Rural				
Development Areas	11.9%	22.1%	66.0%	(1248)
Minimum Rural				
Development Areas	10.6%	20.6%	68.9%	(659)
Maximum Rural				
Development Areas	8.7%	22.2%	69.0%	(1294)
Individual Tenure Farms	10.7%	17.9%	71.4%	(462)
Administrative Towns	9.8%	15.2%	75.0%	(96)
Company Towns	7.6%	13.4%	79.0%	(374)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.

Table 7
 Percentage of Children Stunted,*
 By Land Tenure and Education of Mother
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

	Education of Mother			
	None/Adult	Grade 1- Standard 5	Form 1- 6/ University	Unknown
Swazi Nation Land	35.5% (798)	31.9% (1334)	22.8% (552)	37.7% (517)
Individual Tenure Farms	35.3% (111)	28.4% (200)	20.0% (115)	33.8% (36) ⁺
Administrative Towns	-- (6) ⁺	28.1% (35) ⁺	22.6% (35) ⁺	-- (20) ⁺
Company Towns	33.7% (91)	20.5% (136)	12.5% (110)	15.0% (37) ⁺

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

* Stunted is defined as height-for-age Z-score <-2.00 S.D.

⁺A number <50 is considered statistically unreliable;
 percentages are not provided for any number ≤20.

Table 8
 Percentage of Children Stunted,*
 By Land Tenure and Age of Child
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Age in Months</u>	<u>Swazi Nation Land</u>		<u>Individual Tenure Farm</u>		<u>Administrative Town</u>		<u>Company Town</u>	
3-5	16.1%	(161)	7.5%	(27) ⁺	--	(4) ⁺	3.3%	(25) ⁺
6-11	18.1%	(347)	14.4%	(55)	--	(8) ⁺	9.7%	(48) ⁺
12-23	37.7%	(703)	41.1%	(108)	18.8%	(22) ⁺	21.6%	(92)
24-35	31.7%	(725)	28.1%	(105)	--	(16) ⁺	17.8%	(82)
36-47	35.9%	(704)	26.3%	(93)	31.2%	(27) ⁺	31.0%	(64)
48-59	34.1%	(561)	33.2%	(74)	--	(19) ⁺	30.2%	(63)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

* Stunted is defined as height-for-age Z-score <-2.00 S.D.

⁺A number <50 is considered statistically unreliable.

Table 9
 Percentage Distribution of Height-for-Age
 By District
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>>-2.00</u>	
Hhohho	11.2%	20.3%	68.5%	(1054)
Lubombo	8.7%	21.5%	69.9%	(982)
Manzini	9.1%	18.5%	72.4%	(1034)
Shiselweni	11.1%	20.9%	68.0%	(1063)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

Table 10
 Percentage Distribution of Height-for-Age
 By Possessions Owned by Homestead
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Working Refrigerator				
Yes	2.6%	8.1%	89.2%	(245)
No	10.5%	21.0%	68.5%	(3870)
Vehicle				
Yes	6.2%	15.1%	78.7%	(666)
No	10.8%	21.3%	67.9%	(3454)
Stove				
Yes	6.4%	15.7%	77.9%	(1369)
No	12.0%	22.7%	65.3%	(2757)
Tractor				
Yes	7.0%	15.6%	77.4%	(212)
No	10.2%	20.6%	69.2%	(3910)
Sewing Machine				
Yes	7.4%	18.8%	73.8%	(1074)
No	11.0%	20.8%	68.2%	(3049)
Radio				
Yes	9.1%	20.4%	70.5%	(3672)
No	17.1%	19.9%	63.0%	(458)
Spring bed				
Yes	9.5%	19.9%	70.6%	(3808)
No	15.9%	25.0%	59.1%	(320)
Maize Milling Machine				
Yes	10.6%	21.8%	67.6%	(2448)
No	9.3%	18.3%	72.5%	(1674)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.
 Unknowns are excluded because the number of unknowns is <50.

Table 11
 Percentage Distribution of Height-for-Age
 By Possessions Owned by Homestead
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>>-2.00</u>	
Working Refrigerator				
Yes	5.2%	17.2%	77.6%	(116)
No	8.4%	14.7%	76.9%	(537)
Vehicle				
Yes	6.1%	13.5%	80.4%	(163)
No	8.3%	15.8%	75.9%	(494)
Stove				
Yes	7.8%	16.1%	76.1%	(397)
No	7.7%	13.9%	78.4%	(259)
Sewing Machine				
Yes	7.1%	14.5%	78.4%	(241)
No	8.2%	15.6%	76.2%	(416)
Radio				
Yes	7.9%	15.0%	77.1%	(632)
No	3.8%	19.2%	76.9%	(26) [†]
Maize				
Milling Machine				
Yes	6.7%	16.7%	76.7%	(30) [†]
No	7.8%	15.2%	77.0%	(626)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.
 Unknowns are excluded because the number of unknowns is <50.

[†]A number <50 is considered statistically unreliable.

Table 12
 Percentage Distribution of Height-for-Age
 By Highest Level of Education Achieved Within Homestead
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Highest Level of Education</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
None/Adult	16.7%	27.6%	55.7%	(205)
Grades 1-2	7.0%	33.4%	59.6%	(120)
Standards 1-5	12.6%	20.7%	66.7%	(1525)
Forms 1-6	8.1%	19.3%	72.6%	(2007)
College/University	5.3%	12.4%	82.3%	(269)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.
 Unknowns are excluded because the number of unknowns is <50.

Table 13
 Percentage Distribution of Height-for-Age
 By Highest Level of Education Achieved Within Homestead
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

<u>Highest Level of Education</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>		<u>>= -2.00</u>	
	<u>Severe</u> <u>< -3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>		
None/Adult	--	--	--	(7) ⁺
Grades 1-2	--	--	--	(2) ⁺
Standards 1-5	12.1%	15.2%	72.7%	(66)
Forms 1-6	7.0%	15.1%	77.9%	(470)
College/University	8.0%	15.0%	77.0%	(113)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.
 Unknowns are excluded because the number of unknowns is <50.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 14
 Percentage Distribution of Height-for-Age
 By Number of Cattle Owned
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Number of Cattle</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
0	8.6%	19.0%	72.2%	(1552)
1-2	7.7%	20.1%	72.2%	(90)
3-4	9.7%	16.7%	73.6%	(164)
5-9	13.1%	23.1%	63.8%	(507)
10-14	11.1%	17.7%	71.1%	(522)
15-19	11.4%	22.3%	66.3%	(344)
20-24	9.1%	19.7%	71.2%	(342)
≥25	9.6%	21.2%	69.3%	(479)
Unknown	10.6%	33.1%	56.3%	(133)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.

Table 15
 Percentage Distribution of Height-for-Age
 By Cultivation of Land
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>>=-2.00</u>	
Land Cultivated for Homestead Use				
Yes	10.4%	21.3%	68.4%	(3642)
No	7.5%	13.5%	79.0%	(479)
Homestead Vegetable Garden				
Yes	8.4%	18.8%	72.8%	(1578)
No	11.1%	21.3%	67.6%	(2505)
Unknown	7.4	19.1	73.5	(50)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.
 Unknowns are excluded when the number of unknowns is <50.

Table 16

Percentage Distribution of Height-for-Age
By Cultivation of Land for Homestead Use
Swaziland National Nutrition Status Survey, 1983
(Peri-Urban Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>		≥ -2.00	
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>		
Land Cultivated for Homestead Use				
Yes	10.0%	19.9%	70.1%	(201)
No	6.8%	13.0%	80.2%	(454)
Homestead Vegetable Garden				
Yes	9.8%	14.0%	76.2%	(235)
No	6.7%	15.9%	77.4%	(421)

NOTE: Percentages are weighted on the basis of population proportions;
actual number surveyed is given in parenthesis.

Table 17
Percentage Distribution of Height-for-Age
By Presence of a Homestead Vegetable Garden
And by Maternal Education
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

<u>Education of Mother</u>	<u>Vegetable Garden</u>	<u>Height-for-Age Z-Score</u>		<u>Number</u>
		<u><-2.00</u>	<u>>-2.00</u>	
None/Adult	Yes	36.4%	63.6%	(310)
	No	34.7%	65.3%	(684)
Grade 1- Standard 5	Yes	27.0%	73.0%	(646)
	No	32.5%	67.5%	(1037)
Forms 1-6/ University	Yes	17.9%	82.1%	(392)
	No	23.9%	76.1%	(411)
Unknown	Yes	30.8%	69.2%	(230)
	No	37.8%	62.2%	(373)

NOTE: Percentages are weighted on the basis of population proportions;
actual number surveyed is given in parenthesis.

Table 18
 Percentage Distribution of Height-for-Age
 By Use of Crops Grown by the Homestead
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Use of Crops Grown</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Maize				
Homestead Only	11.1%	21.7%	67.2%	(3131)
Mostly Homestead	8.6%	23.1%	68.3%	(220)
Cash (half or more)	2.5%	13.2%	84.3%	(115)
Pumpkins				
Homestead Only	10.2%	21.1%	68.6%	(2043)
Mostly Homestead	9.3%	22.3%	68.4%	(108)
Cash (half or more)	--	20.0%	80.0%	(23) ⁺
Jugo Beans, Beans and/or Cowpeas				
Homestead Only	11.0%	20.4%	68.6%	(1307)
Mostly Homestead	7.4%	18.1%	74.5%	(92)
Cash (half or more)	5.5%	16.4%	78.1%	(67)
Sweet Potatoes/Yams				
Homestead Only	9.9%	22.5%	67.6%	(620)
Mostly Homestead	13.8%	11.6%	74.6%	(33) ⁺
Cash (half or more)	8.9%	27.1%	64.0%	(38) ⁺
Sorghum				
Homestead Only	10.3%	22.9%	66.7%	(307)
Mostly Homestead	5.8%	35.1%	59.1%	(32) ⁺
Cash (half or more)	--	--	--	(6) ⁺
Tobacco/Cotton				
Homestead Only	7.0%	34.5%	58.5%	(44) ⁺
Mostly Homestead	--	--	--	(7) ⁺
Cash (half or more)	12.2%	16.4%	71.4%	(372)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.
 Table excludes 491 children from homesteads in which land was not cultivated for homestead use.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 19
 Percentage Distribution of Height-for-Age
 By Use of Maize Grown by the Homestead
 And by Maternal Education
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Education of Mother</u>	<u>Use of Maize If Grown</u>	<u>Height-for-Age Z-Score</u>		<u>Number</u>
		<u><-2.00</u>	<u>≥-2.00</u>	
None/Adult	Homestead Only	37.0%	63.0%	(770)
	Mostly Homestead	24.1%	75.9%	(80)
	Cash (half or more)	--	--	(20) ⁺
Grade 1- Standard 5	Homestead Only	32.6%	67.4%	(1334)
	Mostly Homestead	32.8%	67.2%	(81)
	Cash (half or more)	17.4%	82.6%	(43) ⁺
Forms 1-6/ University	Homestead Only	23.9%	76.1%	(543)
	Mostly Homestead	30.8%	69.2%	(29) ⁺
	Cash (half or more)	7.3%	92.7%	(29) ⁺
Unknown	Homestead Only	36.7%	63.3%	(484)
	Mostly Homestead	47.8%	52.2%	(30) ⁺
	Cash (half or more)	20.6%	79.4%	(23) ⁺

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.
 Table excludes 491 children from homesteads where maize was not grown.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 20
 Percentage Distribution of Height-for-Age
 By Main Source of Homestead Income
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Main Source of Income</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Agriculture/ Self-Employed	11.7%	22.2%	66.1%	(1152)
Agriculture/ Employed	14.0%	16.7%	69.2%	(118)
Salaried, Government	5.4%	18.2%	76.4%	(514)
Salaried, Non-Government Inside Swaziland	10.3%	20.3%	69.4%	(1234)
Salaried, Non-Government Outside Swaziland	9.7%	19.9%	70.4%	(427)
Self-Employed	8.9%	18.3%	72.9%	(260)
Combination	9.2%	21.5%	69.4%	(304)
Other/Unknown	13.8%	18.4	67.9%	(124)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

Table 21
 Percentage Distribution of Height-for-Age
 By Main Source of Homestead Income
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

<u>Main Source of Income</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Agriculture/ Ag/Self-Employed	--	--	--	(4) ⁺
Salaried, Government	9.9%	12.3%	77.8%	(162)
Salaried, Non-Government Inside Swaziland	8.4%	16.7%	74.9%	(275)
Salaried, Non-Government Outside Swaziland	--	--	--	(11) ⁺
Self-Employed	6.8%	14.8%	78.4%	(88)
Combination	3.8%	12.8%	83.3%	(78)
Other/Unknown	7.5%	15.0%	77.5%	(40)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 22
 Percentage Distribution of Height-for-Age
 By Usual Place of Defecation for Homestead Children
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Open/Bush	11.8%	22.7%	65.5%	(3018)
Wooden Latrine	7.0%	17.1%	75.9%	(522)
Concrete Latrine	4.7%	11.8%	83.5%	(219)
Flush Toilet	5.0%	10.2%	84.8%	(325)
Other/Unknown	--	23.4%	26.6%	(49) ⁺

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 23
 Percentage Distribution of Height-for-Age
 By Usual Place of Defecation for Homestead Children
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Open/Bush	10.0%	17.8%	72.2%	(180)
Wooden Latrine	8.5%	14.0%	77.6%	(272)
Concrete Latrine	5.9%	13.3%	80.7%	(135)
Flush Toilet	--	7.4%	92.6%	(27) ⁺
Other/Unknown	4.5%	22.7%	72.7%	(44) ⁺

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 24
 Percentage Distribution of Height-for-Age
 By Usual Source of Water for Homestead
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Private tap	5.1%	10.7%	84.2%	(279)
Public tap	7.9%	18.4%	73.7%	(720)
Dam/pond	7.6%	21.3%	71.1%	(184)
Well/borehole	4.5%	26.1%	69.4%	(136)
Protected spring	11.5%	19.9%	68.6%	(247)
Unprotected spring	11.8%	21.2%	67.0%	(825)
River/stream	11.5%	22.2%	66.2%	(1681)
Other/Unknown	8.2%	14.4%	77.4%	(61)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.

Table 25
 Percentage Distribution of Height-for-Age
 By Usual Source of Water for Homestead
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>>-2.00</u>	
Private tap	2.5%	7.6%	89.9%	(79)
Public tap	8.6%	17.9%	73.5%	(408)
Dam/pond	---	---	--	(1)+
Well/borehole	--	--	--	(11)+
Protected spring	6.1%	15.2%	78.8%	(33)+
Unprotected spring	7.1%	11.9%	81.0%	(42)+
River/stream	8.7%	10.0%	81.3%	(80)
Other/Unknown	--	--	--	(4)+

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

+A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 26
 Percentage of Children Stunted
 By Usual Place of Defecation
 And Usual Source of Water for Homestead
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Sanitation Facility</u>	<u>Water Source</u>					
	<u>Public Tap</u>		<u>Private Tap</u>		<u>Other</u>	
	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>
Open/Bush	32.1	(398)	16.5	(29)+	35.1	(2591)
Latrine/ Toilet	20.1	(307)	15.9	(247)	21.3	(512)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

+A number <50 is considered statistically unreliable.

Table 27
 Percentage of Children Stunted
 By Usual Place of Defecation
 And Maternal Education
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Sanitation Facility</u>	<u>Maternal Education</u>							
	<u>None/Adult</u>		<u>Grade 1-- Standard 5</u>		<u>Form 1-- University</u>		<u>Unknown</u>	
	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>
Open/Bush	36.7	(852)	34.3	(1292)	26.5	(411)	38.2	(463)
Latrine/ Toilet	27.5	(147)	18.4	(388)	15.3	(393)	27.0	(138)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

Sanitation facilities other than those listed are not included
 because the number is <50.

Table 28
 Percentage Distribution of Height-for-Age
 By Number of Homestead and Household Members
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>No. of Persons</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>		≥ -2.00	
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>		
Homestead				
<5	8.1%	20.6%	71.3%	(250)
5-9	9.1%	19.4%	71.5%	(1636)
10-14	11.4%	20.1%	68.6%	(1163)
15-19	11.1%	23.3%	65.7%	(557)
20+	10.0%	20.7%	69.3%	(527)
Household				
<5	9.7%	18.8%	71.5%	(455)
5-9	9.8%	20.5%	69.7%	(2040)
10-14	10.7%	20.2%	69.1%	(1104)
15-19	10.8%	21.3%	67.9%	(392)
20+	7.0%	20.3%	72.8%	(142)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.

Table 29

Percentage Distribution of Height-for-Age
By Number of Homestead Members <5 Years of Age
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

<u>Number of Homestead Members <5 Years of Age</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
1	8.8%	17.9%	73.3%	(803)
2	9.2%	20.2%	70.6%	(1404)
3	12.0%	19.9%	68.1%	(829)
4	12.0%	25.2%	62.8%	(402)
5+	9.6%	21.3%	69.1%	(691)

NOTE: Percentages are weighted on the basis of population proportions;
actual number surveyed is given in parenthesis.
Unknowns are excluded because the number of unknowns is <50.

Table 30
 Percentage Distribution of Height-for-Age
 By Number of Homestead and Household Members
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

<u>No. of Persons</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Homestead				
<5	2.5%	20.3%	77.2%	(79)
5-9	9.2%	11.0%	79.9%	(273)
10-14	10.8%	17.5%	71.7%	(166)
15-19	5.7%	18.9%	75.5%	(53)
20+	3.4%	17.2%	79.3%	(87)
Household				
<5	3.7%	13.7%	82.5%	(160)
5-9	8.6%	15.0%	76.4%	(326)
10-14	11.7%	18.8%	69.5%	(128)
15-19	--	13.3%	86.7%	(30) ⁺
20+	--	--	--	(14) ⁺

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 31

Percentage Distribution of Height-for-Age
By Number of Homestead Members <5 Years of Age
Swaziland National Nutrition Status Survey, 1983
(Peri-Urban Sample Only)

<u>Number of Homestead Members <5 Years of Age</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe <-3.00</u>	<u>Moderate -3.00 to -2.00</u>	<u>≥-2.00</u>	
1	7.7%	13.7%	78.6%	(168)
2	8.3%	16.3%	75.4%	(252)
3	8.8%	14.0%	77.2%	(114)
4	5.7%	17.0%	77.4%	(53)
5+	4.3%	15.7%	80.0%	(70)

NOTE: Percentages are weighted on the basis of population proportions;
actual number surveyed is given in parenthesis.

Table 32

Percentage Distribution of Height-for-Age
By Maternal Membership and Residence Status
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

<u>Maternal Membership and Residence Status</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>>-2.00</u>	
Homestead Member and Resident \geq 50% of the Time	9.7%	20.2%	70.1%	(3444)
Homestead Member and Resident <50% of the Time	8.1%	17.3%	74.6%	(137)
Not a Member	12.4%	21.8%	65.9%	(539)

NOTE: Percentages are weighted based on population proportions;
actual number surveyed is given in parenthesis.
Unknowns are excluded because the number of unknowns is <50.

Table 33

Percentage Distribution of Height-for-Age
By Maternal Membership and Residence Status
Swaziland National Nutrition Status Survey, 1983
(Peri-Urban Sample Only)

<u>Maternal Membership and Residence Status</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Homestead Member and Resident ≥50% of the Time	7.7%	14.5%	77.9%	(574)
Homestead Member and Resident <50% of the Time	--	--	--	(10) ⁺
Not a Member	9.6%	19.2%	71.2%	(73)

NOTE: Percentages are weighted based on population proportions;
actual number surveyed is given in parenthesis.
Unknowns are excluded because the number of unknowns is <50.

⁺A number <50 is considered statistically unreliable.
Percentages are not provided for any number ≤20.

Table 34
 Percentage Distribution of Height-for-Age
 By Maternal Employment Status
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Maternal Employment Status</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>		<u>≥-2.00</u>	
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>		
Unemployed	10.2%	21.3%	68.5%	(2693)
Employed				
Inside Home	8.1%	18.6%	73.4%	(464)
Outside Home	8.4%	13.4%	78.2%	(415)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis. Table excludes 539 children whose mothers were not members of the homestead and therefore their employment status was not ascertained. Unknowns are excluded because the number of unknowns is <50.

Table 35
 Percentage of Children Stunted,*
 By Maternal Employment Status
 And Maternal Membership and Residence Status
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Maternal Membership and Residence Status</u>	<u>Maternal Employment Status</u>					
	<u>Unemployed</u>		<u>Employed Inside Home</u>		<u>Employed Outside Home</u>	
Homestead Member and Resident ≥50% of the Time	31.6%	(26.4)	26.4%	(456)	21.8%	(326)
Homestead Member and Resident <50% of the Time	28.8%	(43) ⁺	--	(7) ⁺	22.3%	(87)
Not a Member	36.3%	(282)	--	(4) ⁺	29.7%	(223)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

*"Stunted" is defined as height-for-age Z-score <-2.00 S.D.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 36
 Percentage Distribution of Height-for-Age
 By Maternal Employment Status
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

<u>Maternal Employment Status</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Unemployed	7.0%	16.7%	76.3%	(287)
Employed				
Inside Home	5.6%	8.9%	85.6%	(90)
Outside Home	9.5%	14.9%	75.6%	(201)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis. Table excludes 73 children whose mothers were not members of the homestead and therefore their employment statuses were not ascertained. Unknowns are excluded because the number of unknowns is <50.

Table 37
 Percentage Distribution of Height-for-Age
 By Occupation of Mother
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Occupation of Mother</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Salaried (Government)	3.9%	10.3%	85.7%	(179)
Salaried (Nongovernment, Nonagriculture), Inside Swaziland	11.4%	16.6%	72.0%	(238)
Seller or Hawker	6.8%	22.6%	70.6%	(349)
Homemaker/Unemployed	10.0%	21.1%	68.9%	(2617)
Cash Subsistence, Farmer	14.5%	20.5%	64.9%	(70)
Other/Unknown	13.1%	13.4%	73.5%	(141)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.
 Table excludes 539 children whose mothers were not members of the homestead and therefore their occupational statuses were not ascertained.
 Unknowns are excluded because the number of unknowns is <50.

Table 38
 Percentage Distribution of Height-for-Age
 By Occupation of Mother
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

<u>Occupation of Mother</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Salaried (Government)	8.5%	13.6%	78.0%	(59)
Salaried (Nongovernment, Nonagriculture), Inside Swaziland	10.5%	12.1%	77.4%	(124)
Seller or Hawker	5.9%	19.1%	75.0%	(68)
Homemaker/Unemployed	6.5%	15.7%	77.8%	(306)
Cash/Subsistence Farmer	--	--	--	(3) ⁺
Other/Unknown	4.0	8.0	88.0	(25) ⁺

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis. Table excludes 73 children whose mothers were not members of the homestead and therefore their occupational statuses were not ascertained.

Unknowns are excluded because the number of unknowns is <50.

⁺A number <50 is considered statistically unreliable. Percentages are not provided for any number ≤20.

Table 39

Percentage Distribution of Height-for-Age
By Education of the Mother
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

<u>Education of Mother</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>>-2.00</u>	
None	13.1%	22.2%	64.7%	(853)
Adult	12.2%	23.0%	64.8%	(153)
Grade 1 - Standard 5	9.7%	20.6%	69.7%	(1705)
Forms 1-6	5.5%	16.4%	78.1%	(740)
University, College	2.0%	6.0%	92.1%	(72)
Unknown	14.6%	28.4%	57.0%	(71)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.
Table excludes 539 children whose mothers were not members of a homestead, and therefore their educational statuses were not ascertained.

Table 40
 Percentage Distribution of Height-for-Age
 By Education of the Mother
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

<u>Education of Mother</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
None	8.3%	27.1%	64.6%	(48) ⁺
Adult	--	--	--	(5) ⁺
Grade 1 - Standard 5	11.2%	14.0%	74.9%	(179)
Forms 1-6	5.7%	13.3%	81.0%	(315)
University, College	--	--	--	(20) ⁺

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.
 Table excludes 73 children whose mothers were not members of a homestead and therefore their educational levels were not ascertained.
 Unknowns are excluded because the number of unknowns is <50.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 41
Percentage Distribution of Height-for-Age
By Mother's Age
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

<u>Mother's Age</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>		<u>≥-2.00</u>	
	<u>Severe</u>	<u>Moderate</u>		
	<u><-3.00</u>	<u>-3.00 to -2.00</u>		
<20	10.2%	16.9%	72.9%	(286)
20-24	7.5%	21.3%	71.2%	(1060)
25-29	9.4%	20.5%	70.2%	(873)
30-34	9.1%	18.8%	72.1%	(618)
35-39	14.4%	18.4%	67.2%	(417)
40+	11.7%	20.7%	67.6%	(319)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.
 Table excludes 539 children whose mothers were not members of a homestead, and therefore their ages were not ascertained.
 Unknowns are excluded because the number of unknowns is <50.

Table 42
 Percentage of Children Stunted,*
 By Maternal Age and Age of Child
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

Age of Child In Months	Maternal Age In Years			
	<35		≥35	
3-5	11.6%	(195)	24.9%	(21) [†]
6-11	15.5%	(381)	24.6%	(60)
12-23	35.0%	(685)	36.8%	(156)
24-59	31.3%	(1576)	32.6%	(499)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.
 Table excludes 539 children whose mothers were not members of a
 homestead, and therefore their ages were not ascertained.
 Unknowns are excluded because the number of unknowns is <50.

* Stunted is defined as height-for-age Z-score <-2.00 S.D.

[†]A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 43
 Percentage Distribution of Height-for-Age
 By Mother's Age
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

<u>Mother's Age in Years</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
<20	5.6%	11.1%	83.3%	(54)
20-24	6.2%	14.6%	79.2%	(178)
25-29	6.1%	19.6%	74.3%	(148)
30-34	14.3%	8.6%	77.1%	(105)
35-39	7.6%	13.6%	78.8%	(66)
40+	3.0%	21.2%	75.8%	(33) ⁺

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.
 Table excludes 73 children whose mothers were not members of a homestead, and therefore their ages were not ascertained.
 Unknowns are excluded because the number of unknowns is <50.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 44
 Percentage Distribution of Children Stunted
 By Birth Order of Children Born Alive
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Birth Order of Children Born Alive</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
1	7.9%	17.3%	74.7%	(479)
2-3	8.3%	20.6%	71.1%	(1383)
4-5	10.9%	22.0%	67.1%	(835)
6-7	10.2%	19.2%	70.6%	(566)
8+	14.1%	18.9%	67.0%	(300)
Unknown	12.3	21.5	66.2	(570)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

Table 45
 Percentage Distribution of Children Stunted
 By Birth Order of Children Born Alive
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

Birth Order of Children Born Alive	Age in Months							
	3-5		6-11		12-23		24-59	
1	5.1%	(42) ⁺	18.1%	(103)	32.1%	(157)	28.1%	(177)
2-3	16.4%	(85)	16.5%	(175)	35.6%	(312)	30.3%	(811)
4-5	11.2%	(42) ⁺	11.4%	(82)	40.6%	(187)	35.3%	(524)
6-7	6.6%	(33) ⁺	23.2%	(59)	29.5%	(111)	32.3%	(363)
8+	--	(10) ⁺	22.1%	(25) ⁺	36.7%	(68)	32.7%	(197)
Unknown		(5) ⁺	--	(14) ⁺	37.1	(90)	34.0	(461)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 46
Percentage Distribution of Children Stunted
By Birth Order of Children Born Alive
Swaziland National Nutrition Status Survey, 1983
(Pari-Urban Sample Only)

<u>Birth Order of Children Born Alive</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
1	6.3%	12.6%	81.1%	(111)
2-3	5.4%	14.6%	80.0%	(240)
4-5	11.6%	17.1%	71.3%	(129)
6-7	10.1%	13.9%	75.9%	(79)
8+	--	--	--	(20) ⁺
Unknown	8.9	19.0	72.2	(79)

NOTE: Percentages are weighted on the basis of population proportions:
 actual number surveyed is given in parenthesis.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 47
 Percentage Distribution of Height-for-Age
 By Number of Deaths of Mother's Live-Born Children
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Total Sibling Deaths</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>>-2.00</u>	
0	8.0%	20.0%	72.0%	(2222)
1	10.2%	20.7%	69.1%	(795)
2	13.6%	20.8%	65.6%	(332)
3+	17.6%	18.5%	63.9%	(231)
Unknown	12.6	21.4	66.0	(553)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis. Table excludes 539 children whose mothers were not members of a homestead, and therefore their birth histories were not ascertained.

Table 48

Percentage Distribution of Height-for-Age
By Number of Deaths of Mother's Live-Born Children
Swaziland National Nutrition Status Survey, 1983
(Peri-Urban Sample Only)

<u>Total Sibling Deaths</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
0	7.7%	14.1%	78.2%	(418)
1	7.4%	13.7%	78.9%	(95)
2	13.2%	21.1%	65.8%	(38) ⁺
3+	--	19.4%	80.6%	(31) ⁺
Unknown	9.2	18.4	72.4	(76)

NOTE: Percentages are weighted on the basis of population proportions;
actual number surveyed is given in parenthesis.
Table excludes 73 children whose mothers were not members of a
homestead, and therefore their birth histories were not ascertained.

⁺A number <50 is considered statistically unreliable.
Percentages are not provided for any number ≤20.

Table 49
 Percentage Distribution of Height-for-Age
 By Mother's Marital Status
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Married	9.7%	20.8%	69.5%	(2801)
Not Married/Divorced	9.5%	17.6%	72.9%	(789)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.
 Table excludes 539 children whose mothers were not members of a homestead, and therefore their marital statuses were not ascertained.
 Unknowns are excluded because the number of unknowns is <50.

Table 50
 Percentage Distribution of Height-for-Age
 By Mother's Marital Status
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Married	6.7%	15.7%	77.6%	(388)
Not Married/Divorced	9.4%	13.1%	77.5%	(191)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis. Table excludes 73 children whose mothers were not members of a homestead, and therefore their marital statuses were not ascertained. Unknowns are excluded because the number of unknowns is <50.

Table 51
Percentage Distribution of Height-for-Age
By Father's Membership and Residence Status
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

<u>Father's Membership and Residence Status</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>>-2.00</u>	
Homestead Member and Resident \geq 50% of the Time	9.2%	19.4%	71.4%	(1484)
Homestead Member and Resident <50% of the Time	10.2%	21.2%	68.6%	(1012)
Not a member	10.7%	20.6%	68.7%	(1623)

NOTE: Percentages are weighted on the basis of population proportions;
actual number surveyed is given in parenthesis.
Unknowns are excluded because the number of unknowns is <50.

Table 52

Percentage Distribution of Height-for-Age
By Father's Membership and Residence Status
Swaziland National Nutrition Status Survey, 1983
(Peri-Urban Sample Only)

<u>Father's Membership and Residence Status</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Homestead Member and Resident ≥50% of the Time	7.2%	15.6%	77.2%	(333)
Homestead Member and Resident <50% of the Time	1.9%	11.5%	86.5%	(52)
Not a Member	9.5%	15.4%	75.1%	(273)

NOTE: Percentages are weighted on the basis of population proportions;
actual number surveyed is given in parenthesis.
Unknowns are excluded because the number of unknowns is <50.

Table 53
 Percentage Distribution of Height-for-Age
 By Education of Father
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Education of Father</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
None	13.9%	22.3%	63.8%	(648)
Adult	13.4%	24.3%	62.2%	(210)
Grade 1 - Standard 5	9.0%	20.3%	70.7%	(925)
Forms 1-6	5.1%	17.1%	77.9%	(510)
University, College	3.1%	2.8%	94.1%	(79)
Unknown	7.9	21.8	70.3	(135)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.
 Table excludes 1626 children whose fathers were not members of a homestead, and therefore their educational levels were not ascertained.

Table 54
 Percentage Distribution of Height-for-Age
 By Education of Father
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

<u>Education of Father</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
None	16.7%	13.3%	70.0%	(30) ⁺
Adult	--	--	--	(9) ⁺
Grade 1 - Standard 5	9.9%	15.7%	74.4%	(121)
Forms 1-6	2.8%	15.8%	81.4%	(177)
University, College	5.6%	8.3%	86.1%	(36) ⁺

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis. Table excludes 273 children whose fathers were not members of a homestead, and therefore their educational levels were not ascertained.

Unknowns are excluded because the number of unknowns is <50.

⁺A number <50 is considered statistically unreliable. Percentages are not provided for any number ≤20.

Table 55
 Percentage Distribution of Height-for-Age
 By Number of Father's Wives
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
1 Wife	9.5%	20.0%	70.5%	(2078)
2 Wives	10.3%	22.5%	67.3%	(605)
3 Wives	12.1%	23.5%	64.4%	(184)
≥4 Wives	15.6%	25.6%	58.8%	(83)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis. Table excludes 1156 children whose mothers were not married at the time of the survey. Unknowns are excluded because the number of unknowns is <50.

Table 56
Percentage of Survey Children Stunted*
By Education of Father and
By Number of Father's Wives
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

	<u>Education of Father</u>				<u>Total</u>
	<u>None/Adult</u>	<u>Grade 1 Standard 5</u>	<u>Form 1 University</u>	<u>Unknown</u>	
1 Wife	34.6% (539)	28.8% (611)	20.7% (425)	32.3% (503)	29.5% (2078)
2 Wives	36.3% (183)	32.5% (186)	18.7% (85)	36.6% (151)	32.7% (605)
≥3 Wives	47.8% (111)	30.2% (80)	21.6% (30) ⁺	35.0% (46) ⁺	37.3% (267)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.
 Table excludes 1156 children whose mothers were not married at the time of the survey.

Unknowns are excluded because the number of unknowns is <50.

* Stunted is defined as height-for-age Z-score <-2.00 S.D.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 57
 Percentage Distribution of Height-for-Age
 By Occupation of Father
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Occupation of Father</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>>-2.00</u>	
Salaried (Government)	6.9%	18.9%	74.2%	(444)
Salaried (Nongovernment, Nonagriculture), Inside Swaziland	9.0%	18.7%	72.3%	(957)
Businessman/Shopkeeper	16.7%	12.8%	70.4%	(23)+
Unemployed	10.5%	19.8%	69.8%	(272)
Agricultural	12.6%	23.8%	63.6%	(224)
Seller or Hawker	6.0%	33.2%	60.8%	(65)
Other/Unknown	11.4%	21.2%	67.4%	(522)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.
 Table excludes 1626 children whose fathers were not members of a homestead, and therefore their occupational statuses were not ascertained.

+A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤ 20 .

Table 58

Percentage Distribution of Height-for-Age
By Occupation of Father
Swaziland National Nutrition Status Survey, 1983
(Peri-Urban Sample Only)

<u>Occupation of Father</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
Salaried (Government)	9.6%	16.7%	73.7%	(114)
Salaried (Nongovernment, Nonagriculture), Inside Swaziland	6.3%	13.6%	80.1%	(191)
Businessman/Shopkeeper	--	--	--	(14)+
Unemployed	--	--	---	(15)+
Seller or Hawker	--	--	--	(15)+
Other/Unknown	2.5	12.5	85.0	(40)+

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.
Table excludes 273 children whose fathers were not members of a homestead, and therefore their occupational statuses were not ascertained.

+A number <50 is considered statistically unreliable.
Percentages are not provided for any number ≤20.

Table 59
Percentage Distribution of Height-for-Age
By Total Travel Time
To Nearest Health Clinic
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

<u>Travel Time</u>	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
<30 Minutes	6.9%	13.2%	79.8%	(865)
30-59 Minutes	9.6%	21.5%	68.9%	(1309)
1-2 Hours	11.1%	23.1%	65.8%	(1142)
2 Hours	12.1%	22.2%	65.7%	(789)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.
 Unknowns are excluded because the number of unknowns is <50.

Table 60

Percentage Distribution of Height-for-Age
By Attendance at Maternal and Child Health Clinics
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
History of Attendance	9.1	19.7	71.2	(3202)
Clinic Card, 1983 Visit	8.5%	18.0%	73.5%	(1264)
Clinic Card, No 1983 Visit	8.9%	22.2%	68.9%	(689)
No Clinic Card	9.9%	20.2%	69.9%	(1249)
History of No Attendance	13.4%	22.2%	64.4%	(839)
Unknown	11.5%	22.9%	65.6%	(92)

NOTE: Percentages are weighted on the basis of population proportions;
actual number surveyed is given in parenthesis.

Table 61

Percentage Distribution of Height-for-Age
By Attendance at Maternal and Child Health Clinics and
By Age of Child
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

Age in Months	Clinic Attendance	Height-for-Age Z-Score			Number
		Underweight			
		Severe <-3.00	Moderate <-3.00 to >-2.00	>-2.00	
3-11	History of Attendance	1.9	12.6	85.5	(521)
	Clinic Card, 1983 Visit	1.9%	11.3%	86.7%	(358)
	Clinic Card, No 1983 Visit	--	--		(19) [†]
	No Clinic Card	2.0%	14.3%	83.7%	(144)
	History of No Attendance	5.9%	13.4%	80.8%	(143)
12-23	History of Attendance	10.2	23.1	66.7	(746)
	Clinic Card, 1983 Visit	10.4%	21.5%	68.1%	(412)
	Clinic Card, No 1983 Visit	11.7%	26.2%	62.1%	(96)
	No Clinic Card	9.2%	24.6%	66.2%	(238)
	History of No Attendance	17.1%	28.7%	54.2%	(167)
24-59	History of Attendance	10.7	20.3	69.0	(1935)
	Clinic Card, 1983 Visit	11.6%	19.9%	68.5%	(494)
	Clinic Card, No 1983 Visit	8.7%	21.4%	69.9%	(574)
	No Clinic Card	11.3%	19.9%	68.8%	(867)
	History of No Attendance	14.2%	22.6%	63.1%	(529)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.

Unknowns are excluded when the number of unknowns is <50.

[†]A number <50 is considered statistically unreliable.

Percentages are not provided for any number ≤20.

Table 62

Percentage Distribution of Height-for-Age
By Attendance at Maternal and Child Health Clinics
Swaziland National Nutrition Status Survey, 1983
(Peri-Urban Sample Only)

	<u>Height-for-Age Z-Score</u>			<u>Number</u>
	<u>Stunting</u>			
	<u>Severe</u> <u><-3.00</u>	<u>Moderate</u> <u>-3.00 to -2.00</u>	<u>≥-2.00</u>	
History of Attendance	6.6	14.8	78.6	(467)
Clinic Card, 1983 Visit	6.5%	12.5%	81.0%	(200)
Clinic Card, No 1983 Visit	6.3%	17.5%	76.2%	(80)
No Clinic Card	7.0%	16.0%	77.0%	(187)
History of No Attendance	9.3%	17.0%	73.6%	(182)

NOTE: Percentages are weighted on the basis of population proportions;
actual number surveyed is given in parenthesis.
Unknowns are excluded because the number of unknowns is <50.

Table 63
 Percentage of Children Stunted,*
 By Method of Feeding and
 By Age of Child
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Age in Months</u>	<u>Exclusively Breastfed</u>		<u>Partially Breastfed (Breast Milk Plus Other)</u>		<u>Weaned From Breast</u>	
	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>
3-5	6.5	22+	13.2	(199)	-	(21)+
6-11	-	7	17.2	(425)	6.7	(89)
12-17	-	4	31.9	(318)	25.4	(221)
18-23	-	-	46.9	(104)	39.1	(353)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.
 Unknowns are excluded because the number of unknowns is <50.

* Stunted is defined as height-for-age Z-score <-2.00 S.D.

+A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 64
 Percentage Distribution of Weight-for-Height
 For Children 3-23 Months of Age
 Swaziland National Nutrition Status Survey, 1983

Weight-for-Height Standard Deviation	Rural (n = 1600)		Peri-Urban (n = 270)	
	%	Cumulative %	%	Cumulative %
Under -3.50	0.1	0.1	--	--
-3.50 to -3.01	0.1	0.2	--	--
-3.00 to -2.51	0.5	0.7	--	--
-2.50 to -2.01	1.0	1.7	--	--
-2.00 to -1.51	2.1	3.8	2.2	2.2
-1.50 to -1.01	4.4	8.2	4.8	7.0
-1.00 to -0.51	9.4	17.6	8.9	15.9
-0.50 to -0.00	17.9	35.5	18.1	34.0
+0.00 to +0.50	24.0	59.5	21.9	55.9
+0.51 to +1.00	15.3	74.8	18.1	74.0
+1.01 to +1.50	10.8	85.6	10.4	84.4
+1.51 to +2.00	6.1	91.7	6.7	91.1
+2.01 or more	8.3	100.0	8.9	100.0

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

+A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤ 20 .

Table 65
 Percentage Distribution of Weight-for-Height
 For Children 24-59 Months of Age
 Swaziland National Nutrition Status Survey, 1983

Weight-for-Height Standard Deviation	Rural (n = 2533)		Peri-Urban (n = 388)	
	%	Cumulative %	%	Cumulative %
Under -3.50	--	--	--	--
-3.50 to -3.01	--	--	--	--
-3.00 to -2.51	0.1	0.1	--	--
-2.50 to -2.01	0.3	0.4	1.0	1.0
-2.00 to -1.51	1.3	1.7	0.8	1.8
-1.50 to -1.01	4.3	6.0	3.6	5.4
-1.00 to -0.51	12.3	18.3	14.2	19.6
-0.50 to -0.00	22.1	40.4	21.1	40.7
+0.00 to +0.50	30.1	70.5	31.7	72.4
+0.51 to +1.00	16.8	87.3	15.5	87.9
+1.01 to +1.50	7.9	95.2	6.4	94.3
+1.51 to +2.00	3.3	98.5	3.6	97.9
+2.01 or more	1.5	100.0	2.1	100.0

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

+A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤ 20 .

Table 66
 Percentage Distribution of Children
 By Weight-for-Height and
 By Age and Sex
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Age in Months</u>	<u>Sex</u>	<u>Weight-for-Height Z-Score</u>		<u>Number</u>
		<u><-2.00</u>	<u>≥-2.00</u>	
3-5	Male	0.9%	99.1%	(110)
	Female	2.5%	97.5%	(107)
	Total	1.7%	98.3%	(217)
6-11	Male	1.3%	98.7%	(221)
	Female	1.8%	98.2%	(237)
	Total	1.6%	98.4%	(458)
12-17	Male	2.4%	97.6%	(269)
	Female	0.8%	99.2%	(240)
	Total	1.6%	98.4%	(509)
18-23	Male	4.0%	96.0%	(204)
	Female	--	100.0%	(212)
	Total	2.0%	98.0%	(416)
24-35	Male	0.3%	99.7%	(466)
	Female	0.2%	99.8%	(462)
	Total	0.2%	99.8%	(928)
36-47	Male	0.6%	99.4%	(442)
	Female	--	100.0%	(446)
	Total	0.3%	99.7%	(888)
48-59	Male	0.5%	99.5%	(325)
	Female	0.7%	99.3%	(392)
	Total	0.6%	99.4%	(717)
Total	Male	1.2%	98.8%	(2037)
	Female	0.6%	99.4%	(2096)
	Total	0.9%	99.1%	(4133)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

+A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 67
 Percentage Distribution of Children
 By Weight-for-Height and
 By Age and Sex
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

<u>Age in Months</u>	<u>Sex</u>	<u>Weight-for-Height Z-Score</u>		<u>Number</u>
		<u>Wasted <-2.00</u>	<u>≥-2.00</u>	
3-5	Male	--	--	(17) ⁺
	Female	--	--	(14) ⁺
	Total	--	100.0%	(31) ⁺
6-11	Male	--	100.0%	(39) ⁺
	Female	--	100.0%	(46) ⁺
	Total	--	100.0%	(85)
12-17	Male	--	100.0%	(37) ⁺
	Female	--	100.0%	(37) ⁺
	Total	--	100.0%	(74)
18-23	Male	--	100.0%	(46) ⁺
	Female	--	100.0%	(34) ⁺
	Total	--	100.0%	(80)
24-35	Male	--	100.0%	(66)
	Female	1.6%	98.4%	(62)
	Total	0.8%	99.2%	(128)
36-47	Male	1.3%	98.7%	(74)
	Female	1.4%	98.6%	(69)
	Total	1.4%	98.6%	(143)
48-59	Male	1.7%	98.3%	(57)
	Female	--	100.0%	(56)
	Total	0.9%	99.1%	(113)
TOTAL	Male	0.6%	99.4%	(336)
	Female	0.6%	99.4%	(318)
	Total	0.6%	99.4%	(654)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 68
 Percentage Distribution of Children,
 By Weight-for-Height and Agroecological Zone
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

<u>Agroecological Zone</u>	<u>Weight-for-Height Z-Score</u>		<u>Number</u>
	<u>Wasted</u> <u><-2.00</u>	<u>≥-2.00</u>	
Highveld	0.8%	99.2%	(1108)
Middleveld	0.6%	99.4%	(1603)
Lowveld	1.2%	98.8%	(1226)
Lubombo	2.0%	98.0%	(196)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

Table 69

Percentage Distribution of Children,
By Weight-for-Height and Land Tenure
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

	<u>Weight-for-Height Z-Score</u> <u>Wasted</u>		<u>Number</u>
	<u><-2.00</u>	<u>≥-2.00</u>	
Swazi Nation Land			
Non-Rural			
Development Areas	0.5%	99.5%	(1248)
Minimum Rural			
Development Areas	0.8%	99.2%	(659)
Maximum Rural			
Development Areas	0.9%	99.1%	(1294)
Individual Tenure Farms	1.2%	98.8%	(462)
Administrative Towns	-	100.0%	(96)
Company Towns	1.8%	98.2%	(374)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.

Table 70
Percentage of Children
By Weight-for-Height and District
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

	<u>Weight-for-Height Z-Score</u>		<u>Number</u>
	<u>Wasted</u> <u><-2.00</u>	<u>≥-2.00</u>	
Hhohho	0.1%	99.9%	(1054)
Lubombo	1.4%	98.6%	(982)
Manzini	0.9%	99.1%	(1034)
Shiselweni	1.1%	98.9%	(1063)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

Table 71
Percentage Distribution of Weight-for-Age
Of Children 3-23 Months Old
Swaziland National Nutrition Status Survey, 1983

<u>Weight-for-Age Standard Deviation</u>	<u>Rural (n = 1600)</u>		<u>Peri-Urban (n = 270)</u>	
	<u>%</u>	<u>Cumulative %</u>	<u>%</u>	<u>Cumulative %</u>
Under -3.50	0.5	0.5	-	-
-3.50 to -3.01	1.1	1.7	0.4	0.4
-3.00 to -2.51	3.1	4.8	1.5	1.9
-2.50 to -2.01	5.0	9.8	4.4	6.3
-2.00 to -1.51	10.2	19.9	9.3	15.6
-1.50 to -1.01	14.3	34.1	10.7	26.3
-1.00 to -0.51	17.5	51.7	15.6	41.9
-0.50 to -0.00	15.3	66.9	15.9	57.8
+0.00 to +0.50	11.7	78.6	18.9	76.7
+0.51 to +1.00	8.1	86.8	8.9	85.6
+1.01 to +1.50	6.5	93.3	5.6	91.2
+1.51 to +2.00	2.7	96.0	3.3	94.5
+2.01 or more	4.0	100.0	5.6	100.0

NOTE: Percentages are weighted on the basis of population proportions;
actual number surveyed is given in parenthesis.

Table 72
 Percentage Distribution of Weight-for-Age
 For Children 24-59 Months of Age
 Swaziland National Nutrition Status Survey, 1983

Weight-for-Age Standard Deviation	Rural (n = 2533)		Peri-Urban (n = 388)	
	%	Cumulative %	%	Cumulative %
Under -3.50	0.3	0.3	-	-
-3.50 to -3.01	1.0	1.3	0.5	0.5
-3.00 to -2.51	2.6	3.9	2.1	2.6
-2.50 to -2.01	5.9	9.8	7.0	9.6
-2.00 to -1.51	13.2	23.0	9.8	19.4
-1.50 to -1.01	18.1	41.1	17.3	36.7
-1.00 to -0.51	20.4	61.5	21.6	58.3
-0.50 to -0.00	16.0	77.5	19.6	77.9
+0.00 to +0.50	12.7	90.2	12.9	90.8
+0.51 to +1.00	6.0	96.2	6.4	97.2
+1.01 to +1.50	2.2	98.4	1.5	98.7
+1.51 to +2.00	1.0	99.4	0.8	99.5
+2.01 or more	0.5	100.0	0.5	100.0

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

Table 73
Percentage Distribution of Weight-for-Age
By Age and Sex
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

<u>Age in Months</u>	<u>Sex</u>	<u>Weight-for-Age Z-Score</u>		<u>Number</u>
		<u><-2.00</u>	<u>>=2.00</u>	
3-5	Male	2.1%	97.9%	(110)
	Female	3.5%	96.5%	(107)
	Total	2.8%	97.2%	(217)
6-11	Male	8.4%	91.6%	(221)
	Female	6.5%	93.5%	(237)
	Total	7.4%	92.6%	(458)
12-17	Male	16.5%	83.5%	(269)
	Female	7.7%	92.3%	(240)
	Total	12.3%	87.7%	(509)
18-23	Male	15.1%	84.9%	(204)
	Female	10.9%	89.1%	(212)
	Total	12.9%	87.1%	(416)
24-35	Male	9.7%	90.3%	(466)
	Female	10.5%	89.5%	(462)
	Total	10.1%	89.9%	(928)
36-47	Male	8.5%	91.5%	(442)
	Female	9.1%	90.9%	(446)
	Total	8.8%	91.2%	(888)
48-59	Male	12.6%	87.4%	(325)
	Female	9.1%	90.9%	(392)
	Total	10.7%	89.3%	(717)
Total	Male	10.8%	89.2%	(2037)
	Female	8.8%	91.2%	(2096)
	Total	9.8%	90.2%	(4133)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.

Table 74
 Percentage Distribution of Weight-for-Age
 By Age and Sex
 Swaziland National Nutrition Status Survey, 1983
 (Peri-Urban Sample Only)

Age in Months	Sex	Weight-for-Age Z-Score		Number
		Underweight		
		<-2.00	≥-2.00	
3-5	Male	--	--	(17) ⁺
	Female	--	--	(14) ⁺
	Total	--	--	(31) ⁺
6-11	Male	2.6%	97.4%	(39) ⁺
	Female	--	100.0%	(46) ⁺
	Total	1.2%	98.8%	(85)
12-17	Male	13.5%	86.5%	(37) ⁺
	Female	5.4%	94.6%	(37) ⁺
	Total	9.5%	90.5%	(74)
18-23	Male	17.4%	82.6%	(46) ⁺
	Female	2.9%	97.1%	(34) ⁺
	Total	11.2%	88.7%	(80)
24-35	Male	9.1%	90.9%	(66)
	Female	9.5%	90.5%	(63)
	Total	9.3%	90.7%	(129)
36-47	Male	10.7%	89.3%	(75)
	Female	14.3%	85.7%	(70)
	Total	12.4%	87.6%	(145)
48-59	Male	5.2%	94.8%	(58)
	Female	7.1%	92.9%	(56)
	Total	6.1%	93.9%	(114)
TOTAL	Male	9.2%	90.8%	(338)
	Female	7.2%	92.8%	(320)
	Total	8.2%	91.8%	(658)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.

⁺A number <50 is considered statistically unreliable.
 Percentages are not provided for any number ≤20.

Table 75
Percentage Distribution of Weight-for-Age
By Agroecological Zone
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

<u>Agroecological Zone</u>	<u>Weight-for-Age Z-Score</u>		<u>Number</u>
	<u><-2.00</u>	<u>≥-2.00</u>	
Highveld	10.6%	89.4%	(1108)
Middleveld	8.7%	91.3%	(1603)
Lowveld	10.2%	89.8%	(1226)
Luhombo	10.6%	89.4%	(196)

NOTE: Percentages are weighted on the basis of population proportions;
actual number surveyed is given in parenthesis.

Table 76
 Percentage of Children Stunted
 By Weight-for-Age and Land Tenure
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

	<u>Weight-for-Age Z-Score</u>		<u>Number</u>
	<u><-2.00</u>	<u>≥-2.00</u>	
Swazi Nation Land			
Non-Rural			
Development Areas	12.1%	87.9%	(1248)
Minimum - Rural			
Development Areas	11.0%	89.0%	(659)
Maximum - Rural			
Development Areas	7.9%	92.1%	(1294)
Individual Tenure Farms	9.6%	90.4%	(462)
Administrative Towns	8.8%	91.2%	(96)
Company Towns	8.1%	91.9%	(374)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis.

Table 77
 Percentage Distribution of Weight-for-Age
 By District
 Swaziland National Nutrition Status Survey, 1983
 (Rural Sample Only)

	<u>Weight-for-Age Z-Score</u>		<u>Number</u>
	<u><-2.00</u>	<u>≥-2.00</u>	
Hhohho	9.9%	90.1%	(1054)
Lubombo	10.1%	89.9%	(982)
Manzini	7.6%	92.4%	(1034)
Shiselweni	11.4%	88.6%	(1063)

NOTE: Percentages are weighted on the basis of population proportions;
 actual number surveyed is given in parenthesis.

Table 78

Percentage Distribution of Weight-for-Age
By Attendance at Maternal and Child Health Clinics
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

<u>Clinic Attendance</u>	<u>Weight-for-Age Z-Score</u>		<u>Number</u>
	<u><-2.00</u>	<u>>-2.00</u>	
History of Attendance	8.8%	91.2%	(3202)
Clinic Card, Visit 1983	9.0%	91.0%	(1264)
Clinic Card, No Visit 1983	9.4%	90.6%	(689)
No Clinic Card	8.3%	91.7%	(1249)
History of No Attendance	13.3%	86.7%	(839)
Unknown	12.3%	87.7%	(92)

NOTE: Percentages are weighted on the basis of population proportions;
actual number surveyed is given in parenthesis.

Table 79

Percentage Distribution of Weight-for-Age
By Attendance at Maternal and Child Health Clinics and
Age of Child
Swaziland National Nutrition Status Survey, 1983
(Rural Sample Only)

Age in Months	Clinic Attendance	Weight-for-Age Z-Score Underweight		Number
		<-2.00	>-2.00	
3-11	History of Attendance	5.3%	94.7%	(521)
	Clinic Card, 1983 Visit	4.3%	95.7%	(358)
	Clinic Card, No 1983 Visit	--	--	(19) ⁺
	No Clinic Card	6.8%	93.2%	(144)
	History of No Attendance	7.6%	92.4%	(143)
12-23	History of Attendance	11.1%	88.9%	(746)
	Clinic Card, 1983 Visit.	12.8%	87.2%	(412)
	Clinic Card, No 1983 Visit	10.7%	89.3%	(96)
	No Clinic Card	8.4%	91.6%	(238)
	History of No Attendance	19.3%	80.7%	(167)
24-59	History of Attendance	8.9%	91.1%	(1935)
	Clinic Card, 1983 Visit	9.3%	90.7%	(494)
	Clinic Card, No 1983 Visit	9.0%	91.0%	(574)
	No Clinic Card	8.5%	91.5%	(867)
	History of No Attendance	12.9%	87.1%	(529)
	Unknown	13.1%	86.9%	(69)

NOTE: Percentages are weighted on the basis of population proportions; actual number surveyed is given in parenthesis. Unknowns are excluded when the number of unknowns is <50.

⁺A number <50 is considered statistically unreliable. Percentages are not provided for any number ≤20.

Table 80

Percentage Distribution of Weight-for-Age
By Attendance at Maternal and Child Health Clinics
Swaziland National Nutrition Status Survey, 1983
(Peri-Urban Sample Only)

(Rural Sample Only)

<u>Clinic Attendance</u>	<u>Weight-for-Age Z-Score</u>		<u>Number</u>
	<u><-2.00</u>	<u>≥-2.00</u>	
History of Attendance	7.1%	92.9%	467
Clinic Card, 1983 Visit	6.0%	94.0%	(200)
Clinic Card, No 1983 Visit	10.0%	90.0%	(80)
No Clinic Card	7.0%	93.0%	(187)
History of No Attendance	10.4%	89.6%	(182)

NOTE: Percentages are weighted on the basis of population proportions;
actual number surveyed is given in parenthesis.
Unknowns are excluded because the number of unknowns is <50.

Table 81

Prevalence of Undernutrition in Children
Standard Deviations and Percents of Median
Swaziland National Nutrition Status Survey, 1983

	<u>Height-for-Age</u>			<u>Weight-for-Height</u>			<u>Weight-for-Age</u>		
	<u>Standard Deviation</u>		<u>Percent of Median</u>	<u>Standard Deviation</u>		<u>Percent of Median</u>	<u>Standard Deviation</u>		<u>Percent of Median</u>
	<u><-2.5</u>	<u><-2.0</u>	<u><90</u>	<u><-2.5</u>	<u><-2.0</u>	<u><80</u>	<u><-2.5</u>	<u><-2.0</u>	<u><80</u>
Rural	17.9	30.3	16.6	0.3	0.9	0.4	4.2	9.8	12.4
Peri-urban	13.2	22.9	12.9	--	0.6	0.2	2.3	8.2	9.7

Table 82
Prevalence of Undernutrition
Among African Children ≤ 59 Months of Age

<u>Country and Date of Survey</u>	<u>Age in Months</u>	<u>Chronic Undernutrition "Stunting" <90% of Median Ht/Age</u>	<u>Acute Undernutrition "Wasting" <80% of Median Wt/Ht</u>	<u>Underweight <80% of Median Wt/Age</u>
Swaziland. . . 1983	3-59	16.6%	0.4%	12.4%
Senegal. . . 1982 (Sine-Saloum)	0-59	26.1%	4.4*	22.7%**
Cameroon . . 1978	3-59	22.1%	1.0%	21.1%
Egypt. . . . 1978	6-71	21.2%	0.6%	8.8%*
Sierra Leone 1978	3-59	24.2%	3.0%	30.5%
Togo 1977	6-71	19.1%	2.0%	15.3%*
Liberia. . . 1976	0-59	18.0%	1.6%	24.0%
Lesotho. . . 1976	3-59	22.7%	1.1%	22.0%

NOTE: All surveys conducted by CDC or UCLA. Percentages are based on representative samples only. Adapted from table prepared by Food Policy and Nutrition Division, FAO, UN.

*3-59 months only.

**Underweight is defined as <75% of the reference median weight-for-age.

Table 83
Prevalence of Undernutrition
Among African Children <59 Months of Age
By Rural/Urban Location
(Percentage of Children in Each Category)

<u>Country and Date</u> <u>of Survey</u>	<u>Chronic</u> <u>Undernutrition</u> <u>Stunting</u>		<u>Acute</u> <u>Undernutrition</u> <u>Wasting</u>		<u>Underweight</u>	
	<90% of Median Ht/Age		<80% of Median Wt/Ht		<80% of Median Wt/Age	
	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>	<u>Urban</u>
Swaziland 1983	16.6	12.9	0.4	0.2	12.4	9.7
Cameroon 1978	22.4	15.5	1.1	0.7	23.0	12.2
Egypt 1978	23.8	15.0	0.7	0.5	9.9*	6.1*
Sierra Leone 1978	26.2	17.4	3.2	3.2	32.4	24.3
Togo 1977	20.4	11.4	2.2	0.8	16.5*	8.9*
Liberia 1976	20.2	13.8	1.6	1.7	25.5	N/A
Lesotho 1977	23.7	17.2	4.3	3.0	24.9	17.3

NOTE: All surveys conducted by CDC or UCLA. Percentages are based on representative and convenience samples (for urban areas in some countries). Adapted from table prepared by Food Policy and Nutrition Division, FAO, UN.

*Underweight is defined as <75% of the reference median weight-for-age.

Table 84
Prevalence of Stunting
Among African Children \leq 59 Months of Age
By Country and Age Group

<u>Country and Date</u> <u>of Survey</u>	<u>Age in Months</u>				
	<u>6-11</u>	<u>12-23</u>	<u>24-35</u>	<u>36-47</u>	<u>48-59</u>
Swaziland 1983	6.1%	17.3%	16.2%	20.8%	20.6%
Cameroon 1978	9.4%	20.0%	23.4%	27.4%	26.8%
Egypt 1978	10.2%	26.2%	26.5%	22.6%	16.3%
Sierra Leone 1978	14.2%	22.6%	27.3%	28.1%	30.5%
Togo 1977	6.5%	15.0%	18.6%	24.4%	23.9%
Liberia 1976	12.5%	22.3%	21.1%	20.5%	24.7%
Lesotho 1977	11.6%	24.1%	28.6%	26.5%	27.3%

NOTE: All surveys conducted by CDC or UCLA. Percentages are based on representative sample only. Adapted from table prepared by Food Policy and Nutrition Division, FAO, UN.
Stunting is defined as <90% of the reference median height-for-age.

Table 85
Prevalence of Wasting*
Among African Children \leq 59 Months of Age
By Country and Age Group
(Percentage of Children in Each Category)

<u>Country and Date of Survey</u>	<u>Age in Months</u>				
	<u>6-11</u>	<u>12-23</u>	<u>24-35</u>	<u>36-47</u>	<u>48-59</u>
Swaziland 1983	1.4%	0.6%	0.0%	0.2%	0.1%
Cameroon 1978	1.4%	1.4%	1.1%	0.9%	0.5%
Egypt 1978	1.5%	1.2%	0.3%	0.2%	0.2%
Sierra Leone 1978	4.8%	5.6%	2.2%	1.3%	0.3%
Togo 1977	3.2%	4.5%	1.8%	0.8%	0.5%
Liberia 1976	1.9%	2.4%	0.7%	0.4%	1.1%
Lesotho 1977**	5.3%	3.4%	4.1%	2.7%	1.5%

NOTE: All surveys were conducted by CDC or UCLA. Percentages are based on representative sample only. Adapted from table prepared by Food Policy and Nutrition Division, FAO, UN.

* Wasting is defined as <80% of the reference median weight-for-height.

**Wasting is defined as <85% of the reference median weight-for-height for Lesotho.

APPENDIX 1

PROCEDURES FOR ANTHROPOMETRIC MEASUREMENTS

Since physical growth is one of the best indicators of the nutritional status of children, its careful measurement is useful for adequate assessment of their nutritional status. Total body length or height and weight are the measurements most frequently carried out to provide useful information on growth. In practice, however, the accuracy and precision of these measurements are often unsatisfactory. Small differences between groups are immensely important, but this significance may be obscured if the measurements have not been made with sufficient accuracy or precision.

The following equipment and procedures were used in the Swaziland survey.

A. Equipment1. Measuring Board

A combination height/length board that has been custom-made with metric scale to 0.1 cm.

2. Scale

A portable, hanging 25 kg scale with 0.1 kg divisions and pants for suspending the child from the scale.

B. Procedures

The measurements were done in the following order:

1. Weight (survey children ≥ 3 months old.)
2. Length/height (survey children ≥ 3 months old.)

1. Weight

- a. The scale was suspended from a pole held by two assistants.
- b. The child was undressed by the parent or guardian.
- c. The parent held the child; the measurer reached his or her arms through the leg holes of the scale pants and drew the legs of the child through the leg holes. He then attached the scale pants to the scale.
- d. While the child was suspended from the pole, the scale was read to the nearest 0.1 kg. When the pointer tip was at or beyond the midway point of a 0.1 kg graduation, weight recorded as the next higher 0.1 kg, the reading was made after the child was reasonably still and the needle was stationary.
- e. The measurer then recorded the weight clearly in the appropriate blocks on the questionnaire.
- f. The child was then removed from the scale pants and reclothed.

2. Length or Height

For children <2 years of age, supine length was measured.

For children \geq 2 years of age, standing height was measured.

a. Length measurements

- (1) The measuring board was laid horizontally on the ground or on a table.
- (2) With the help of at least one assistant,^{*} the barefoot baby was placed on the board with its head against the fixed end of the board.

* Assistants are necessary--a child's strength and mobility cannot be overstated.

- (3) An assistant held the baby's head in the Frankfort plane^{**} and applied gentle traction to bring the top of the head into contact with the fixed end of the measuring board.
- (4) The measurer held the child's knees together and fully extended the legs.^{***} The measurer used one hand to insure that the child's feet were perpendicular to the board and brought the movable footboard to rest firmly against the child's heels.
- (5) The measurer read the value of the length to the nearest 0.1 cm. When the measurement of a child's length fell at or above the midway point of a 0.1 cm graduation, the child's length was rounded off to the higher 0.1 cm.
- (6) The measurer then recorded the length clearly in the appropriate blocks on the questionnaire.

b. Height measurement

- (1) The measuring board was placed in a vertical position.
- (2) With the help of at least one assistant, the child was positioned barefoot on the horizontal platform with his or her feet together.

^{**} The Frankfort plane is a plane perpendicular to the body and constructed in profile by an imaginary line between the lowest point on the margin of the orbit of the eye and the highest point on the opening of the ear. (As much as 2 cm variation in height or length can be produced by flexing or extending the head out of the Frankfort plane.)

^{***} Children, especially infants, have a tendency to extend their feet while lying or standing. Accurate height or length depends on a measurement from the heel.

- (3) The assistant insured that the child stood flatfooted with the knees fully extended. The shoulders and buttocks were in line with the heels and touched the vertical surface of the measuring board.
- (4) The movable headboard was then brought to rest firmly on the crown of the child's head. The head was held in the Frankfort plane.
- (5) As in a.5 except substitute "height" for "length."
- (6) As in a.6 except substitute "height" for "length."

APPENDIX 2
COMPARISON OF THE SPECIAL GROUP POPULATION WITH
THE NCHS REFERENCE POPULATION

A total of 182 children were weighed and measured from the special group enumeration areas (the method for selecting these areas is presented in chapter 2 in the survey design section: special group sample.) Figures A4.1 and A4.2 show the distribution of the special group population compared with that of the NCHS reference population. Compared to the NCHS reference population, the special group population is shorter overall, but not thinner. Whereas about 2.2% of the NCHS reference population would be expected to fall -2 S.D. below the median, about 15.4% of the special group population is below -2 S.D. for height-for-age and 0.5%, for weight-for-height.

The high percentage of children stunted in the special group raises the question of whether or not the special group is truly an elite population living under ideal environmental conditions. That the special group may not represent a uniformly privileged population is suggested by the mothers' educational levels: 21.4% of mothers had not achieved a Form 1 educational level.

Previous studies from other African populations suggest that the influence of the environment (e.g., nutrition and infectious diseases) is of much greater importance than race or genetic factors in growth of preschool children (Graitcer 1981, Alnwick 1980, Habicht 1974). That the growth potential of Swazi children living under ideal environmental conditions is

similar to that of the NCHS population is supported by the growth patterns of Swazi children whose fathers had at least some college education, 5.7% of whom were below -2.00 S.D. below the median.

References for Appendix 2

Graitcer PL, Gentry EM. Measuring children: one reference for all. *Lancet* 1981;2:297-9.

Alnwick D. The weight, length and mid upper arm circumference of Kenyan children in Nairobi nursery schools. *UNICEF Social Statistics Bull* 1980;3:1-20.

Habicht JP, Martorell R, Yarbrough C, et al. Height and weight standards for pre-school children: how relevant are ethnic differences in growth potential? *Lancet* 1974;1:611-4.

APPENDIX 3**PRECISION ESTIMATES: NUTRITIONAL STATUS****Swaziland National Nutrition Status Survey, 1983****Rural Sample**

**An explanation of statistical terms used in the tables in this Appendix
can be found in Chapter 2, page 2.12.**

A.3 Table 1
Swaziland Rural Precision
Percentage Low Height-for-Age

<u>Characteristic</u>	<u>Number</u>	<u>Prevalence (%)</u>	<u>Standard Error</u>	<u>90% Confidence</u>	<u>Design Effect</u>
Total	4133	30.314	1.163	1.913	2.645
Zone					
Highveld	1108	29.987	2.624	4.316	3.633
Middleveld	1603	31.675	1.619	2.663	1.941
Lowveld	1226	28.057	1.946	3.201	2.300
Lubombo	196	34.855	5.630	9.261	2.736
Tenure					
Non-Rural					
Development Areas	1248	34.047	2.185	3.594	2.652
Minimum Rural					
Development Areas	659	31.113	2.154	3.543	1.427
Maximum Rural					
Development Areas	1294	30.950	1.897	3.121	2.179
Company Towns	374	21.001	2.520	4.145	1.431
Administrative Towns	96	24.996	5.480	9.014	1.538
Individual Tenure Farms	462	28.640	4.691	7.717	4.974
District					
Hhohho	1054	31.505	2.358	3.878	2.715
Lubombo	982	30.113	2.183	3.592	2.224
Manzini	1034	27.630	2.344	3.856	2.841
Shiselweni	1063	31.969	2.347	3.861	2.693
Vehicle Ownership					
Owns Vehicle	666	21.284	2.089	3.437	1.735
Does Not Own Vehicle	3454	32.090	1.214	1.997	2.337
Maximum Homestead Education					
None/Adult	205	44.343	4.293	7.062	1.531
Grade 1-2	120	40.416	5.086	8.367	1.289
Standard 1-5	1525	33.316	1.686	2.773	1.951
Forms 1-6	2007	27.435	1.368	2.250	1.886
College/University	269	17.730	2.538	4.175	1.188
Vegetable Garden					
Has Vegetable Garden	1578	27.230	1.848	3.039	2.718
No Vegetable Garden	2505	32.426	1.109	1.825	1.406
Vegetable Garden Unknown	50	26.541	6.478	10.656	1.076

A.3 Table 2
Swaziland Rural Precision
Percentage Low Height-for-Age

<u>Characteristic</u>	<u>Number</u>	<u>Prevalence (%)</u>	<u>Standard Error</u>	<u>90% Confidence</u>	<u>Design Effect</u>
Total	4133	30.314	1.163	1.913	2.645
Grew Maize					
For Homestead Use Only	3131	32.750	1.311	2.156	2.443
For Mostly Homestead Use	220	31.710	3.004	4.941	0.917
For Cash Crop	115	15.689	2.633	4.332	0.603
Income					
Agriculture/Self-Employed	1152	33.887	2.055	3.380	2.171
Agricultural/Employed	118	30.763	3.715	6.112	0.765
Salaried, Government	514	23.646	2.208	3.631	1.387
Salaried, Non-Gov't Swaziland	1234	30.578	1.964	3.231	2.243
Salaried, Non-Gov't Non-Swaziland	427	29.642	2.389	3.929	1.168
Self-Employment	260	27.150	2.968	4.882	1.158
Combination	304	30.629	3.006	4.945	1.293
Other/Unknown	124	32.123	4.436	7.297	1.119
Defecation Site					
Open/Bush	3018	34.496	1.252	2.060	2.094
Flush Toilet	325	15.215	2.060	3.389	1.070
Concrete Latrine	219	16.523	2.956	4.863	1.388
Wooden Latrine	522	24.100	2.308	3.797	1.520
Other/Unknown	49	23.435	7.197	1.839	1.414
Water Source					
Public Tap	720	26.312	2.340	3.849	2.034
Private Tap	279	15.792	1.661	2.732	0.579
Dam/Pond	184	28.857	5.031	8.277	2.269
Well/Bore Hole	136	30.639	4.886	8.038	1.528
Protected Spring	247	31.399	4.233	6.963	2.054
Unprotected Spring	325	33.031	2.425	3.989	2.193
River/Stream	1681	33.761	1.544	2.540	1.792
Other/Unknown	61	22.572	5.495	9.040	1.054
Children Under 5 Years of Age					
1 Child	803	26.659	1.784	2.935	1.307
2 Children	1404	29.427	1.543	2.538	1.609
3 Children	829	31.910	1.991	3.276	1.513
4 Children	402	37.189	2.836	4.666	1.385
5 or More Children	691	30.908	2.394	3.939	1.855

A.3 Table 3
Swaziland Rural Precision
Percentage Low Height-for-Age

<u>Characteristic</u>	<u>Number</u>	<u>Prevalence (%)</u>	<u>Standard Error</u>	<u>90% Confidence</u>	<u>Design Effect</u>
Total	4133	30.314	1.163	1.913	2.645
Homestead Membership, Mother					
Member, Resident \geq 50%	3444	29.946	1.201	1.976	2.368
Member, Resident <50%	137	25.399	4.293	7.062	1.332
Not Homestead Member	539	34.132	2.404	3.955	1.386
Total Homestead Members	3594	29.747	1.191	1.959	2.440
Employment of Mother					
Unemployed	2693	31.518	1.324	2.177	2.186
Employed Inside Home	464	26.608	2.112	3.475	1.060
Employed Outside Home	415	21.791	2.425	3.989	1.432
Total Homestead Members	3594	29.747	1.191	1.959	2.440
Education of Mother					
None	853	35.282	1.959	3.222	1.433
Adult	153	35.224	4.516	7.429	1.368
Grade 1- Standard 5	1705	30.327	1.524	2.507	1.875
Forms 1-6	740	21.924	1.672	2.750	1.208
College/University	72	7.935	3.436	5.653	1.164
Unknown	71	43.017	5.793	9.530	0.972
Total Homestead Members	3594	29.747	1.191	1.959	2.440
Mother's Age					
<20 Years Old	286	27.063	3.062	5.037	1.358
20-24 Years Old	1060	28.803	1.762	2.898	1.604
25-29 Years Old	873	29.842	1.741	2.864	1.264
30-34 Years Old	618	27.905	2.051	3.374	1.293
35-39 Years Old	417	32.825	2.694	4.432	1.373
>39 Years Old	319	32.374	2.969	4.884	1.284
Live Birth Order for Child					
1	479	25.256	2.278	3.748	1.317
2-3	1383	28.872	1.516	2.493	1.547
4-5	835	32.889	2.190	3.602	1.814
6-7	566	29.424	2.138	3.518	1.246
8+	300	32.970	2.757	4.535	1.032
Unknown	570	33.776	2.293	3.772	1.340
Children Died Past 5 Years					
None	2222	28.013	1.31	2.166	1.910
One Child	795	30.870	1.989	3.272	1.474
Two Children	332	34.449	3.031	4.986	1.351
Three or More Children	231	36.138	3.995	6.571	1.597
Unknown Number of Children	553	33.983	2.338	3.846	1.347

A.3 Table 4
Swaziland Rural Precision
Percentage Low Height-for-Age

<u>Characteristic</u>	<u>Number</u>	<u>Prevalence (%)</u>	<u>Standard Error</u>	<u>90% Confidence</u>	<u>Design Effect</u>
Education of Father					
(Total Homestead Members)	2507	29.651	1.412	2.322	2.395
None	648	36.172	2.631	4.327	1.942
Adult	210	37.770	3.481	5.727	1.083
Grade 1- Standard 5	925	29.312	1.962	3.228	1.719
Forms 1-6	510	22.132	2.620	4.310	2.031
College/University	79	5.870	2.151	3.538	0.661
Unknown	135	29.676	4.413	7.259	1.260
Number of Wives					
Husband Has 1 Wife	2078	29.490	1.403	2.308	1.968
Husband Has 2 Wives	605	32.749	2.068	3.401	1.174
Husband Has 3 Wives	184	35.571	5.080	8.357	2.072
Husband Has ≥ 4 Wives	83	41.205	6.244	10.272	1.336
Occupation of Father					
(Total Homestead Members)	2507	29.651	1.412	2.322	2.395
Salaried, Government	444	25.757	2.696	4.435	1.687
Salaried, Non-Government					
Swaziland	957	27.723	2.054	3.380	2.016
Businessman/Shopkeeper	23	29.565	7.763	12.771	0.666
Unemployed	272	30.220	2.644	4.350	0.902
Agricultural	224	36.425	3.774	6.208	1.378
Seller or Hawker	65	39.174	6.923	11.388	1.307
Other/Unknown	522	32.559	2.563	4.216	1.562
Travel Time to Clinic					
<30 Minutes to Clinic	865	20.175	1.937	3.187	2.016
30-59 Minutes to Clinic	1309	31.099	1.898	3.121	2.200
1-2 Hours to Clinic	1142	34.193	1.659	2.729	1.397
More Than 2 Hours to Clinic	789	34.277	2.333	3.838	1.907
History of Clinic Attendance					
Clinic Card, 1983 Visit	3202	28.839	1.180	1.941	2.173
Clinic Card, No 1983 Visit	1264	26.484	1.603	2.636	1.667
No Clinic Card	689	31.082	1.993	3.278	1.277
History of No Attendance	1249	30.067	1.446	2.379	1.242
Unknown	839	35.608	2.104	3.461	1.620
	92	34.441	5.469	8.996	1.219

F.3 Table 5
Swaziland Rural Precision
Percentage Low Weight-for-Age

<u>Characteristic</u>	<u>Number</u>	<u>Prevalence (%)</u>	<u>Standard Error</u>	<u>90% Confidence</u>	<u>Design Effect</u>
History of Attendance	3202	8.816	0.540	0.887	1.159
Clinic Card, 1983 Visit	1264	9.011	0.896	1.475	1.239
Clinic Card, No 1983 Visit	689	9.362	1.108	1.823	0.998
No Clinic Card	1249	8.307	0.846	1.392	1.174
History of No Attendance	839	13.275	1.457	2.396	1.547
Unknown	92	12.258	3.734	6.142	1.192