TRENDS IN THE NUTRITIONAL STATUS OF BATSWANA

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Introduction

The current world wide emphasis on adequate nutrition is not only timely but indicative of a growing recognition that socio-economic development means little without visible improvements in the quality of life of populations. Nutritional status is a direct indicator of the quality of life as well as socio-economic conditions in a community. In Botswana, the nutritional status of the population has been monitored since 1978 when the facility based National Nutrition Surveillance System (NNSS) was introduced. The NNSS provides monthly data on the prevalence of underweight children from 800 reporting points throughout the country. The NNSS has a remarkable coverage of over 70 percent of underfives. Coverage has grown dramatically with increasing attendance during the current drought.

Nutritional status is not only monitored by the NNSS in Botswana, but also through other administrative data sources, surveys and studies. These include annual in-patient statistics on all age groups and the Continuous Household Integrated Program of Surveys (CHIPS), the first of which was conducted in 1983/84. In addition to these sources, a number of studies have been carried out in the past including the Epidemiology Survey and the Socio-Economic Assessment of Drought Relief, both of 1984.

The most commonly used indicator of nutritional status in Botswana is the underweight prevalence of underfive children (i.e. those children whose weights fall below 80 percent of the Harvard Standard). Children are convenient for monitoring the nutritional status of the population because they are particularly vulnerable to acute and chronic malnutrition as a result of short and long term food shortages. Thus, changes in the nutritional status of young children provides an early indication of likely changes in the overall population. In addition to underweight prevalence, other useful indicators of nutritional status in the context of socio-economic development include trends in infant and child mortality as well as prevalence of low birthweight. Such indicators often highlight the disparities between urban and rural populations as well as regional differences which may be indicative of different levels of development. Ultimately, the most crucial factor affecting nutritional status is food availability at the household level, which must be viewed in light of developments in agriculture.

This paper will focus on trends in nutritional status and associated factors, particularly in the last five years. To the extent that the direction of change in nutritional status has been largely determined by the drought, its direct effects on household food security will also be considered.

Nutritional Status of Children: 1980 - 1985

In a typical non-drought year, the prevalence of underweight children declines by between two and four percent during the first half of the calendar year, and then increases by a similar amount during the second half of the year. The increase during the second half of the year may be a result of household food shortages which occur as supplies from the previous harvest run low, and decreases in the supply of milk as grazing conditions deteriorate.

With the start of the new year, one begins to see improvements in the nutritional status of children. Interestingly, improvements in nutritional status during the first quarter of non-drought years precede the harvest and is most likely due to the increased availability of:

1) milk as grazing conditions improve
2) wild nuts, fruits and vegetables; and
3) rural employment opportunities.

After the autumn (April-May) harvest, increased availability of food at the household helps to continue the downward trend in the prevalence of underweight children in those districts where arable agriculture is feasible. In contrast to non-drought years, during the last four drought years, seasonal fluctuations have virtually vanished. With the onset of the current drought, prevalence rates began to climb beginning 1982. Initially, the increase was centered in those rural districts with arable agriculture (i.e. districts in the North West and the North East regions of the country).

In these regions, the typical non-drought decline in prevalence of underweight children during the first half of the calendar year failed to materialize as milk supplies remained low, wild nuts, fruits and vegetables scarce, and yields from agriculture below normal. During the initial two years of the current drought, prevalence rates from arable agricultural districts remained basically constant during the first three quarters of the year, but increased by one or two percentage points during the latter part of the year. Fortunately, by the middle of 1983, relief efforts of the government facilitated by generous contributions of food from foreign donors, prevented further declines in the nutritional status of children, and in 1984 we begin to see declines in the prevalence of underweight children in arable agricultural districts.

In contrast, the picture in those rural districts with little or no arable agriculture was quite different. In the South and South West of the country, the rural economy is almost exclusively dependent on livestock. Because of the relatively good rains of the previous year, grazing conditions provided adequate fodder for livestock throughout the first year of the drought. The nutritional status of children in these districts did not, therefore, deteriorate during 1982. Unfortunately, by 1983 grazing conditions had deteriorated substantially. This resulted in decreases in the availability of milk and wild nuts, fruits and vegetables. Combined with decreases in cash income and employment opportunities as the condition of cattle deteriorated, the rural districts in the South and South West regions of the country experienced sharp increases in the prevalence of underweight children throughout 1983 and 1984.

Because of the difficulty of effectively distributing food aid in the western part of the country due to the limited transportation network and large distances between settlements, government relief efforts were initially not as effective as they had been in the more populated agricultural districts along the northern and eastern borders of Botswana. Fortunately, however, the dramatic drop in the incidence of underweight children over the last year indicate that the Government was able to overcome these obstacles, and the nutritional status of children in the western part of the country has improved dramatically over the last year.

Drought and Food Security

One of the most significant changes that has taken place as a result of the current drought is the development of a National Food Strategy (NFS) which is coordinated by the Ministry of Finance and Development Planning. The NFS represents the first attempt to explicitly deal with drought related issues through a National Development Plan (NDP-VI). Its major goals include to exploit the irrigation potential of the Okavango delta and several river flood-plains, to enhance food distribution

capacity when rains fail and to train civil servants to assume particular responsibilities in times of drought. Currently, while the end of the drought is anticipated, there are several challenges facing the government. These include a rapidly expanding population and a concomitant rise in the demand for food. In addition, the drought has resulted in sharp declines in food production and rural incomes, especially among female-headed households, owners of small herds, Remote Area dwellers, those deriving a substantial proportion of their incomes form informal sector employment, the grossly under-employed and unemployed households with high economic dependency ratios.

The demand for basic food grains has risen from approximately 100 000 tons in 1979 to 190 000 tons in 1985 and is expected to exceed 200 000 tons by the end of 1991. With the sharp decline in food production during the drought, there has been an increased dependence on imported foods both from commercial sectors and from donor agencies (see Table 1). A large proportion of traditional arable farms planted only two to three hectares on the average in 1985. This accounted for 3.3 percent of total agricultural production. Household food security is, therefore, greatly at risk for a significant proportion of the population.

Currently, while the Drought Relief Programme is on going, and "blanket coverage" of vulnerable groups practiced, underweight prevalence of children has remained remarkably low. This is largely attributable to the extensive, relatively efficient and closely monitored food distribution and relief programme. The resultant progressive improvement in nutritional status observed since 1984 can thus be attributed to the effectiveness of food aid, increased cereal imports and the increase in rural incomes as a result of Labour-Based Relief Projects (LBRPs). Although food aid is distributed to over 60 percent of Botswana's population, it must be noted however that this provides only 21 percent of caloric requirements of the beneficiaries. As a result, the Socio-Economic Assessment of

Drought Relief reported that at least 90 percent of LBRP remittances were spent on food purchases.

Table 1: Availability of Food in Botswana, 1981-84

Season	1981	1982	1983	1984
Domestic Cereal production (tons)	48,860	15,500	12,980	6,230
Total Cereal imports (tons)	79,423	111,020	178,718	170,000
Food aid (tons)	9,248	4,906	24,278	31,333
Total Cereals available (tons)	128,283	126,520	169,698	176,230
Total Cereals available per capita(kg)	136	130	165	163
Total food aid per capita (kg)	9.8	5.0	24.2	29.0

Source: Botswana Agricultural Statistics, 1981; Botswana Agricultural Census, 1982, 1983 and 1984; Customs and Excise Department, External Trade Statistics (Gaborone), 1981-4; and data supplied by the staff of the Department of Food Resources, Ministry of Local Government and Lands, Gaborone.

It can be argued that the government has performed exceedingly well in rendering protection and assistance to the majority of the rural population during the drought. The greatest challenge, however, is that of providing the means of securing household incomes and food for vulnerable rural households after the drought. It is already evident from escalating destitute figures that the productive resources of many rural households have dissipated as a result of drought, and that many of them will not be able to take advantage of the numerous agricultural schemes intended to uplift farming households.

Nutrition and Changes in Dietary Patterns

During the past five years there has been migration to urban areas associated with diminishing agricultural production in the rural areas as a result of the drought. According to the 1981 census 17.7 percent of the population was considered urban, and this is now estimated to have risen to 21.7 percent in 1986. This is probably an underestimation since the projection did not anticipate the substantial urban migration due to the drought. Due to rapid rural urban migration, there has been an increase in the number of women in the formal wage earning sector. However, more than 80 percent of agricultural work is done by women.

Despite unfavourable employment conditions and urbanisation among women, the prevalence of breastfeeding in Botswana has been found to be relatively high. According to the results of the Botswana Family Health Survey conducted in 1984, more than 90 percent of women were found to breastfeed their children. The national median duration of breastfeeding was found to be 18.9 months, with rural women breastfeeding slightly longer than urban women (see Table 2). The difference between rural and urban women is to be expected because of employment factors. Another difference in the duration of breastfeeding is due to the level of education. However, although rural women with little education tend to breastfeed longer than urban women, their children tend to become underweight after

Table 2: Percentage of Women Still Breastfeeding at Specified Intervals By Area of Residence

Months	Urban	Rural	Total
3	96	96	96
6	91	93	93
12	69	74	73
18	37	53	49
24	7	19	16
36	1	1	1

Source: Botswana Family Health Survey, 1984

six months of age and seem less likely to catch up later. This is most likely due to inappropriate weaning practices especially amongst the rural poor where the cost of supplemenation of breastmilk may not be met easily. Therefore, while the duration of breastfeeding in Botswana may indicate a positive trend, supplementary feeding practices fail to adequately complement breastfeeding. There is a widely observed downward trend in weight for age ratios with increasing age. It appears that many Batswana children fail to maintain an adequate rate of growth during the critical weaning period between the ages of six and eighteen months. Data from the Continuous Household Integrated Programme of Surveys - Primary Health Care (CHIPS-PHC) survey indicate that among children under six months of age, over 75 percent are above the 90 percent Weight for Age Index (WAI) value, and only 11 percent below the 80 percent WAI value. In contrast, amongst children older than twenty four months, only 30 percent have WAI values above 90 percent and over 35 percent are underweight.

Low weight for age children consequently fail to maintain a healthy pattern of growth because of repeated episodes of diarrhoea and or inadequate calorie intakes. However, by the age of three years, most children seem to have adjusted to adult diets and household eating practices, and are, therefore, able to cope with sub-optimal intakes of energy and other nutrients. Only a small number of children under five are acutely malnourished. The majority are either small for their age or stunted.

Nutrition Surveillance data from 1979 indicate that wasting (80 percent weight for hieght) was below 5 percent among underfives. However, it was higher in children six to eleven months and double (10 percent) for children twelve to twenty three months. Stunting, (90 percent height for age) was below 10 percent for children up to twelve months, rising during the second year to 30 percent and declining after four years of age. These trends are consonant with the more recent findings of the Epidemiological survey wherein stunting was found to be

more prevalent than wasting. Of the 405 children surveyed seven percent were found to be wasted and 14 percent stunted (see Table 3).

Table 3: Prevalence of Stunting and Wasting

Type of Malnutrition	Number	Percent
Moderately Underweight (80% wt for age)	75	28
Stunted (90% ht/age	36	14
Wasted (80% wt/ht	26	7

Source: Epidemiology Survey, 1984

Diets of Young Children

Existing information on dietary intakes of Batswana and particularly children, is limited by the small sample sizes and (for both the Epidemiology Survey and the Socio-economic Assessment of Drought Relief) the confounding effects of food aid. Unfortunately no dietary studies on a national sample have been conducted during non-drought periods. Thus, it must be noted that data on food intakes collected during the drought is biased by a disproportionate intakes of donated foods, as well as a dearth of wild growing veld foods especially in the rural areas. In the Socio-economic Assessment of Drought, a close look at diets of weanlings revealed a typical cereal-based high bulk diet of low energy density estimated to be about 0.7 kcal/g, including estimates of breastmilk intake. This is about half of the recommended energy density of 1.5 - 2.0 kcal/g for children of between four to twelve months of age. The observed incidence of low energy intakes clearly coincides with the period of poor growth among children in the weaning age.

Young children were found to eat adult foods with the same frequency as adults, i.e. an average of two meals per day. In addition, it was observed that many young children share a plate with older siblings. This often results in the youngest child with the greatest dietary needs getting the lowest food intake. When milk is widely available, it becomes the preferred food for children. When milk is scarce, it is only used in the tea with sugar added, for both adults and children. Breastmilk continues to be the most dependable food for children up to the age of about 20 months.

According to the findings of the Epidemiology Survey, foods other than breastmilk or infant formula were first introduced on average at the age of four months. These foods include powdered milk, soft porridge with or without sugar, Nestum plus milk or infant formula, milk alone and other foods, etc. Soft porridge is usually made from maize or sorghum. If the maize comes from the Health Post, it is usually a blend of maize meal and dry skim milk powder. Of the 30 percent who use porridge and milk powder, 50 percent added milk themselves, the other half gave mealie-meal with milk powder from the Health Post. Nestum and milk or infant formula were found to be in use mainly among respondents who were relatively well off such as teachers and Family Welfare Educators. Table 4 shows consumption patterns of different food groups.

Due to lack of dietary information in previous years, it is difficult to determine trends in child feeding and its effects on child growth and nutritional status for non-drought years. However, the extensive Drought Relief Programme has no doubt had far reaching consequences on the diets of most rural Batswana by providing a different diet as well as cash to further diversify their diets.

Nutritional Status and Other Health Indicators

According to the results of the National Nutritional Surveillance System, underweight prevalence rates rose steeply

at the end of 1981 and remained at high levels until 1984 (see Table 5). During this five year drought period, there has been a general decline in pertinent health indicators. Malnutrition case fatality rates have, however, tended to fluctuate. Unfortunately, although seasonal and regional figures would be more useful, only annual averages are available.

Table 4: Consumption Patterns of Different Food Groups

Food Group	Proportion of Pop.	Special Remarks
Cereals	99%	Twice a day
Legumes	20%	Mainly school children
Milk products	70%	includes milk powder in Rations and tea, coffee
Meat	40%	All age groups except under one year
Fruits & Vegetables	30%	All age groups except very small children

Source: Epidemiology Survey

Table 5: Prevalence of Underweight Children, Percent of Children Under Five with Weight for Age Less than 80 Percent, National Rates, 1981-1985

Months	1981	1982	1983	1984	1985	1986
Jan	27	29	30	31	24	17
Feb	28	28	31	32	21	17
Mar	27	28	30	30	20	17
Apr	29	27	29	31	20	17
May	25	29	30	31	19	16
Jun	24	28	30	30	19	16
Jul	24	28	30	31	17	16
Aug	23	28	30	30	17	15
Sep	24	28	29	30	17	15
Oct	26	28	30	33	17	15
Nov	28	28	31	29	17	14
Dec	30	28	31	18	16	14

Source: Botswana Family Health Survey, 1984.

Table:6 Infant Mortality Rate

Year	Male	Female	Total
1971	103	91	97
1981	80.9	62.2	70.99
1984	74.79	58.32	66.41
1986	72.09	55.86	66.98

Source: Population Census, Central Statistics Office

Table 7: Child Mortality (60 months)

Year	Male	Female	Total
1971	166	139	152.5
1981	123.8	103.8	113.83
1984	114.3	95.6	105.8
1986	108.4	90.6	99.5

Source: Population Census, Central Statistics Office

Table 8: Birth Weights of Infants - Proportion of Birth Weights Under 2500g by Urban and Rural Facilities 1983-4.

Tot. Livebirths		% of National	Total	Total	(2500g	%(2500g)	
1983	1984	1983	1984	1983	1984	1983	1984
Bots. 24,710	25,814	100.0	100.0	2,196	2,173	8.89	8.42
Rural 11,010	14,837	44.5	57.5	1,177	1,245	10.6	8.34
Urban 13,700	10,977	55.5	42.5	1,019	928	7.4	8.45

Source: Medical Statistics Unit, Ministry of Health

Table 9: Malnutrition Case Fatality Rate

Year	Total Maln. Admn.	Total Maln. Deaths	Fatality Rate
1980/81	332	43	12.9%
1982	539	94	17.4%
1983	794	72	9.0%
1984	491	62	12.6%

Source: Medical Statistics Unit, Ministry of Health

Table 9: Incidence of Diarrhoea in Children (60 months)

Year	number of New Cases
1982	29 327
1983	34 535
1984	33 351
1985	30 556

Source: Annual Report of Noticeable Diseases

Tables 6-10 indicate a visible improvement in health indicators associated with nutritional status during a period when nutritional stress is expected to be at its highest due to the drought. This suggests that developments in the health sector have not been hampered by the drought especially in the rural areas. A striking indication of improvement in health indicators is the incidence of low birth weight (see Table 8).

There has been a sharp increase in the proportion of births in the rural health facilities, indicating increased utilization of these facilities. There has also been a distinct narrowing of the difference in incidence of low birth weight in rural facilities and urban facilities from a 3 point difference in 1983 to less than 1 point in 1984. However, there is still a large proportion of home deliveries not included in the reported statistics. The decline in the incidence of diarrheoa after 1983 may be due to both the extensive campaigns in the use of home oral rehydration solutions as well as government efforts to improve rural sanitation and the provision of potable water. Improvement in these indicators has been attributed to a combination of the following factors:

1. Expansion of Primary Health Care Facilities thus better coverage.
2. Increased Food availability as a result of food aid.
3. Increased income earning opportunities in rural areas as a result of Labour Based Relief Programmes (LBRPs).
4. Impact of Health Education
5. Expanded Program of Immunization and Diarrhea Control.
6. Improved nutrition services for under-fives
7. Monitoring of under-fives and direct feeding of underweight children thus improving their chance of survival and reducing hospital admissions due to malnutrition.

Conclusion

The Drought Relief Program has no doubt succeeded in protecting pregnant women, children and other vulnerable groups from what could have been devastating effects of the current drought.

Simultaneous developments in the health, agriculture and other sectors have had a positive impact in sustaining encouraging trends in the improvement of health in the last five years. Food distribution programmes have probably had the greatest impact in mobilizing the population to seek health services, especially when agricultural activities were diminished. The challenge now facing the government will be to continue the positive trends in health indicators despite a rapidly growing population. Attention needs to be given to the special nutritional problems of groups such as children in the weaning ages and pregnant teenagers. Relevant nutrition education campaigns should be mounted. In addition, available, affordable and appropriate foods for various target groups should be promoted.

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