

EDITORIAL

THE NUTRITION SITUATION IN TANZANIA

Tanzania is a united republic consisting of the former Tanganyika and the islands of Zanzibar and Pemba. Tanganyika was under British rule and became independent in 1961 and Zanzibar in 1963. The two countries formed the Union Government in 1964, and today Tanzania is a growing multiparty democracy.

Tanzania is located in the Eastern African region of the Great Lakes between longitudes 29° and 41° east, and latitudes 1° and 12° south of the equator. Tanzania has frontiers with Kenya and Uganda to the north, Rwanda, Burundi and the Democratic Republic of Congo to the west, and Zambia, Malawi and Mozambique to the south; on the east is the Indian Ocean.

Tanzania has a total area of 945 200 km². Mainland Tanzania has a land area of about 881 300 km², of which 61 500 km² is covered with water. The Tanzanian population was estimated to be 29.5 million and was projected to be 32.3 million by the year 2000.¹ The population is characterised by a high dependence ratio of 106% (0 - 14 years 101% and above 65 years 4.8%). Males and females account for 49% and 51% of the total population respectively. About 32% of the population live in urban areas. The rate of urbanisation is 6% per annum. Population characteristics according to functional groups are as follows: 0 - 4 years of age 20.4%; 5 - 14 years 28.7%; youth 15 - 24 years 18.8%; 25 - 60 years 26%; and elderly (above 60 years) 6.1%. The proportion of the latter segment of the population is increasing as a result of improved living conditions. The average life expectancy at birth is 51 years, the total fertility rate is 5.3, the infant mortality rate is 90/1 000 live births, the under-5 mortality rate is 141/1000 live births, and the maternal mortality rate is 530/100 000.

NUTRITION IN TANZANIA

The nutrition situation in Tanzania is not very different from that in other developing countries in sub-Saharan Africa. It is characterised by the co-existence of both under-nutrition and over-nutrition in communities in both urban and rural areas. This means that the meagre resources allocated to the Ministry of Health or Community Development have to address the two forms of malnutrition, often one at the expense of the other. This is because the well-to-do section of the population, which suffers from diseases associated with over-nutrition, also has easy access to the resources allocated for health. The majority of the population, living in poverty (an average of less than one

US dollar a day), which suffers from the nutritional disorders of under-nutrition, has much more limited access to these much-needed resources. Their mortality rate is high.

Tanzania's infant and child mortality rates are high. In 1995, for example, the child and infant mortality rates were 95 and 158/1 000 respectively, a decrease of 32% from the 1975 figures but still among the highest in the world.² Malnutrition in Tanzania is usually the result of a number of factors that interact and leave people vulnerable to various nutritional disorders. Factors include inadequate intake of food due to poor food supply and limited purchasing power, poor health conditions, and lack of information about food and nutrition.³

The prevalence of severe (< -3 standard deviation (SD) of the median value of weight for age) underweight is 7.7% (4.1% in urban and 8.8% in rural areas),⁴ whereas that of moderate underweight (< -3 to < -2 SD of the median value of weight for age) is 27%.⁵ Regional variations in the prevalence of poor nutritional status are observed. There is a high prevalence of severe underweight in the Lindi, Kagera and Iringa regions, and a low prevalence in Kilimanjaro, Tabora and Dar es Salaam. There are various explanations for these variations; for example, one reason could be the severe HIV/AIDS epidemic in Kagera region. Lindi is known to be a food-insecure region, and dietary practices have a detrimental effect on the growth and development of children. Iringa is of particular interest because it still ranks high among regions with a moderate prevalence of under-nutrition. During the early 1980s a UNICEF-supported nutrition programme was implemented in the Iringa region. One of the reasons that led UNICEF to select Iringa as a pilot region was concern about the high prevalence of malnutrition in this region of high food production. Causes of malnutrition were analysed together with communities and strategies to alleviate the problem identified. All the necessary community participatory methods were used to create awareness about the problem and find solutions. Despite all these efforts, 20 years later the prevalence of under-nutrition in Iringa is still high. The reasons for this probably include two important considerations: firstly that the programme had no long-term impact since there was no in-built mechanism to make it sustainable, and secondly that the programme was heavily donor-supported, so when the programme was completed and donor support was withdrawn, the programme also collapsed. The gains observed during implementation of the programme were therefore lost. This is often the fate of donor-driven approaches to solving rural development problems.⁶

NUTRITIONAL STATUS OF SCHOOLCHILDREN

There is a paucity of nutritional data on this group of children. Priority has been given to studies on infants and children up to 5 years of age and on pregnant women (TFNC reports and

EDITORIAL

UNICEF reports). As a result there is scanty information on the nutritional status of school-aged children (6 - 10 years of age). The limited studies conducted^{7,8} (and Momole, 1999 and Igongo, 1997 — unpublished) have shown that protein energy malnutrition exists among school-aged children. Indeed, 10-year-olds appear to have been more adversely affected than children in other age groups. In addition, boys were more affected than girls. A child aged 10 years is often considered as a grown-up, so there is no close supervision or monitoring of their food intake.⁸ This could be a factor contributing to their poor nutritional status.

NUTRITIONAL STATUS OF ADOLESCENTS

This is another group that has been 'forgotten' in nutritional studies in Tanzania, and information on the nutritional status of adolescents is scanty. It is only recently that a few studies have been carried out, mainly in relation to eating disorders and changing food habits among adolescents.^{9,10} Good nutrition during adolescence, is important for healthy growth and development, especially for girls, who it prepares for safe motherhood, since the quality of a girl's diet before menarche is known to exert a significant influence on the development of reproductive capacity.¹¹

A recent study (Mwaluko, 2000 — unpublished) of girls aged 14 and 16 years from different regions of Tanzania and attending primary and secondary education in the Morogoro municipality reported that about 50% were underweight (below -2 SD) and 70% were stunted. These results imply that many adolescent girls are at high risk of poor development, jeopardising or compromising their future role as mothers.

Teenage pregnancies are also common in Tanzania. In a study conducted to determine factors that influence birth weight in Morogoro¹² it was observed that about 15% of the mothers were below 18 years of age, and a high prevalence of low birth weight was observed in this age group. These findings are in agreement with a study conducted in 1985.¹³ It would therefore appear that little has changed since 1985, which reiterates our earlier observation that the adolescent age group has been 'forgotten' in nutrition research and interventions. If there are to be any improvements in maternal health, adolescent girls should be considered part of the priority target population for interventions.

NUTRITIONAL STATUS OF ADULTS

64

Body mass index among adults measured in various areas of Tanzania (spot studies) indicate that under-nutrition is also prevalent in this segment of the population, males being more commonly affected than women, a finding contrary to the conventional belief that women are usually the worst affected.¹⁴ It has always been thought that males are nutritionally better off because they are given more and better food than women

and children in the household, but the available data indicate the contrary to be the case. It is therefore clear that nutritional intervention programmes in Tanzania should also consider chronic under-nutrition in adults, especially males, in the rural as well as in urban areas. Further studies are needed to elucidate the causes of under-nutrition in males.

MATERNAL NUTRITIONAL STATUS

The mean height of mothers in Tanzania is 156 cm, with about 17% being shorter than 150 cm and less than 3% shorter than 145 cm.¹⁵ Stunting (height < 150 cm) in adult women is known to predispose to such obstetric complications as obstruction requiring surgical intervention at delivery,¹⁶ low birth weight¹⁷ and death.^{16,18}

In Tanzania the breast-feeding rate is 97%,¹⁹ and breast-feeding is therefore considered universal. About 60% of babies are breast-fed within 1 hour after delivery and 88% within 24 hours after delivery. Breast-feeding for most non-working mothers is done on demand, irrespective of place, time and the presence of other people. Mothers working in the fields carry their children on their backs and the baby stays with the mother in the field until they return home, ensuring that the child continues to be breast-fed throughout the day. This applies particularly to babies aged 1 - 6 months, but sometimes even after 6 months babies remain with the mother all the time to make sure that breast-feeding is provided on demand. This practice is common in rural and peri-urban areas, but it is not so common among working mothers. A working mother is allowed 84 days of maternity leave, after which she has to return to work and leave her baby with a caregiver. At this stage breast-feeding is not continuous throughout the day, and the child is given porridge or diluted cow's milk while the mother is away. The mother has to make sure that the baby is familiar with the new foods before she goes back to work, so complementary foods or milk substitutes are introduced into the baby's diet much earlier, sometimes as early as 2.5 months. Bottle-feeding is more common among working mothers in urban areas than in rural areas. Weaning starts at the age of 4 months with gradual introduction of semi-liquid foods such as thin porridge prepared from maize flour, and at the age of 6 - 8 months the child is introduced to the family's staple foods. Nevertheless, breast-feeding may continue for as long as 24 months. In some instances mothers may introduce complementary foods much earlier, at the age of 4 - 6 weeks, usually because the mother thinks that the infant is crying a lot and is probably not getting enough breast-milk (personal communication).

COMMON NUTRITIONAL DISORDERS

The most common nutritional disorders related to under-nutrition include protein energy under-nutrition or protein

EDITORIAL

energy deficiency (PEU or PED), iron deficiency anaemia (IDA), iodine deficiency disorders (IDD), and vitamin A deficiency (VAD). Those related to over-nutrition include obesity, overweight, hypertension, heart disease, gout, and diabetes. Non-communicable diseases (NCDs) were thought to be common in urban areas only, but they are also observed in rural areas. Nevertheless, these diseases are more prevalent in urban than in rural areas.

Protein energy under-nutrition

PEU results when the body's needs for energy, protein or both cannot be satisfied by the diet. It has a wide spectrum of manifestations, ranging in severity from weight loss to growth retardation to distinct clinical syndromes frequently associated with deficiencies of vitamins and minerals (e.g. vitamin A, iron and zinc). The most severe clinical manifestations of PEU are kwashiorkor and marasmus. PEU is the most widespread form of under-nutrition in Tanzania and affects all age groups and both genders, although children are more frequently affected than adults.

Causes of marasmus and kwashiorkor are many, ranging from the microeconomics of the household to inadequate national and international policies. The immediate causes related to household economics include age at which complementary feeding is introduced into the child's diet, method of food preparation, choices of foods, frequency of feeding and energy density of weaning foods. Mothers may have difficulty in feeding children frequently if they are working in the fields, and this may be an important constraint on children's food intake; however, it is often offset by the supportive family structure existing in Tanzania. In addition, mothers are not adequately informed about complementary foods that are suitable for children. The mother may have all the necessary and appropriate food items in the household, but not give them to the child owing to lack of knowledge.

Iron deficiency anaemia

The major factor responsible for nutritional anaemia in Tanzania is iron deficiency, with folate and vitamin B₁₂ deficiency also playing a role in some population groups, especially pregnant women. The prevalence of anaemia in children is 86.8%.¹⁵ Severe anaemia (haemoglobin (Hb) < 7.0 g/dl) affects 12.8%. A study conducted in three regions of Tanzania (Morogoro, Mara and Kilimanjaro) showed that 41.6% of adult males had an Hb level below 11 g/dl and that 43.2% of adult had a level below 10 g/dl. It is interesting to note that anaemia is also prevalent in males, contrary to past perceptions that it is uncommon in this segment of the population. Nevertheless, women are more frequently affected than men, and severity and risks are greater in women than in men.

The prevalence of anaemia among adolescent girls in Morogoro municipality was found to be 42% (Kapilima, 2000

— unpublished) and that among pregnant women 85%.²⁰ In a study²⁰ conducted to determine the prevalence of anaemia among pregnant women, it was observed that about 85% of pregnant women had mean corpuscular volume values above 95 fl, which is an indication of folate and vitamin B₁₂ deficiency (megaloblastic anaemia). Anaemia in pregnant women is therefore caused by iron, folate and vitamin B₁₂ deficiency.

Non-dietary anaemia is also prevalent in areas where malaria is holoendemic. These are mainly areas along the coast where weather conditions (hot and humid) favour multiplication of mosquitoes, the vectors of malaria parasites.

Vitamin A deficiency

It has been estimated that xerophthalmia is responsible for between 2 000 and 4 000 new cases of blindness every year, and VAD affects about 6% of the total population in Tanzania.²¹ A recent study²² measuring serum retinol levels in children under 6 years of age showed that 60% of the children had retinol serum levels below 20 µg/dl, considered to be a sign of poor vitamin A status. This clearly indicates that vitamin A is still a public health problem in Tanzania.

Iodine deficiency disorders

About 41% of the population of Tanzania live in iodine-deficient areas and about 25% of the population are affected by IDD.⁷ In a study to determine the prevalence of IDD,²³ it was observed that mean levels of urinary iodine in adults and children ranged from 124 to 576 µg/dl. About 1.6% of the people surveyed had urinary iodine levels below 20 µg/dl, indicating a severe deficiency of iodine.

The treatment and prevention of IDD depend on increasing the intake of iodine in the affected population, either by pharmaceutical preparations or by fortification of a component of diet. Both approaches have been used in Tanzania. By 1999 about 13 million iodised oil capsules had been distributed since the programme on the control and prevention of IDD was introduced in 1980. In addition, 60 salt iodination plants have been established and are in operation and regulations to enforce salt iodination are in place. Iodine is added to salt for human consumption at a level of 100 ppm. As a result there has been a 50% decline in the prevalence of goitre.²³

Non-communicable diseases

NCDs include cardiovascular disease (CVD), such as myocardial infarction and cerebrovascular accidents, diabetes, chronic lung disease, cancer, diseases of bones and joints, and mental illness. The single biggest contributor to morbidity and mortality is coronary heart disease, followed by other CVDs, such as cancer and chronic lung disease. Diabetes is a major contributor to deaths from CVD, but also causes its own unique complications. NCDs are gaining major public health significance in Tanzania. These diseases were non-existent

EDITORIAL

about two decades ago, but their prevalence is reported to be increasing²⁴ and they are more prevalent in urban than in rural areas.²⁴ Nevertheless, NCDs are not solely the concern of the wealthy urban elite; they are also seen among the inhabitants of poorer rural areas. Urban women are particularly at risk from stroke due to under-detection and poor management of high blood pressure. It has been reported^{14,18} that the prevalence of stroke is higher among top executives and the Indian community than in any other segments of the population. In some instances age-specific death rates from NCDs such as stroke are several times higher than in parts of Western Europe.²⁵ In addition, 27% of all adult deaths at district level are due to non-infectious causes. Like under-nutrition, over-nutrition reduces work capacity and productivity because of disease-related absenteeism, while top executives usually travel abroad for treatment, drawing on the country's meagre resources. In 1992, treatment of adults with diabetes (0.2% of the population) was equivalent to 8% of total government health expenditure. A year's treatment for a person with diabetes far exceeds the annual per capita health budget. For example, in the 1990s the daily cost of insulin treatment for diabetes was 0.78 US dollar. This is unaffordable in Tanzania, where up to 42% of the population live in absolute poverty on less than 0.75 US dollar per day.

HIV/AIDS AND NUTRITION

Human immunodeficiency virus (HIV) infection and the acquired immunodeficiency syndrome (AIDS) are pandemic and pose one of the greatest challenges to nutrition and public health. Many HIV/AIDS-related deaths are aggravated by poor nutrition, which contributes significantly to impaired immunity. Nutrition and HIV operate in a cycle, both at the individual level and in society as a whole. Nutritional deficits make HIV-infected people more susceptible to the complications of the disease, and indeed malnutrition is one of the major clinical manifestations resulting from HIV infection, in both children and adults.²⁶

Tanzania is one of the countries in sub-Saharan Africa that has been severely affected by the HIV/AIDS pandemic. Official statistics, which rely mainly on cases reported in hospitals, do not reflect the actual situation in the whole country because many AIDS-related deaths that occur in the rural areas are not captured in national statistics.

The prevalence of HIV infection in the adult population (15 - 49 years) by end of 1999 was estimated at 1 200 000 and the number of deaths due to AIDS was 140 000.²⁵ The prevalence of HIV infection among women seeking antenatal services in Dar es Salaam increased from 4% in 1986 to 12% in 1996. Peak infection rates were recorded among 25 - 29-year-olds attending antenatal clinics. Outside Dar es Salaam the median HIV prevalence increased from 3% in 1987 to 19% in 1998. In 1997, the prevalence among women tested at antenatal clinics

in the 14 reporting sentinel surveillance sites ranged from 4% to 44%. It is estimated that by 2010 the proportion of Tanzania's population infected with HIV will have risen to 17.4% from the current 9.2%.

AIDS is known to develop between less than 1 and up to 20 years from the date of infection with HIV. The median time between infection and becoming ill appears to be 8 - 10 years for adults in developed countries, but is much shorter in developing countries. This difference is thought to be due to the compromised immune function associated with malnutrition as well as the presence of other infectious diseases in developing countries.²⁷ In Tanzania, annual deaths from AIDS are estimated at between 20 000 and 30 000, representing 5 - 7% of total deaths.²⁷ Indeed, AIDS is believed recently to have surpassed malaria as the leading killer among diseases in adults and is likely to do so for children in the very near future.

Future prospects indicate that even if massive efforts to reduce the spread of infection were successful in slowing transmission, the number of AIDS cases and deaths would still increase for the next several years as those already infected reach the stage of actually falling ill with the disease. In this regard, it is projected that the number of AIDS cases will continue to rise to more than 500 000 by 2010.²⁷ As such, increases in both mortality and morbidity are expected to increase with the attendant effects, in particular, on demographic factors such as population growth, age structure and dependency ratio, the economy, the health care system, and agriculture production. If one bears in mind that about 60% of the GDP in the Tanzanian economy comes from agriculture, then it is reasonable to assume that the productivity of workers/farmers who are ill, or caring for others who are ill, will decrease, leading to low food production, greater food insecurity and malnutrition.

CONCLUSION

Despite worthwhile efforts by the government on many fronts, such as the reduction of economic inequalities, food security for all and the provision of free social services to improve the nutrition situation in Tanzania, achievements have been rather limited, due to a number of factors. One of the pertinent factors is the inappropriate perception of nutrition issues among decision makers and individuals alike. At decision maker level nutrition issues have been perceived to belong independently to the health and agricultural sectors only. The health sector is implicated because of the diseases that are caused by under-nutrition, and the agricultural sector because it deals with food production. At the individual level the perception is similar. Such an unfortunate scenario calls for advocacy and lobbying to change the perception of both government and people with regard to nutrition issues. In order to ensure greater success in nutrition improvement, there is an urgent need for a solid multi-sectoral collaboration and articulation of broad-based

EDITORIAL

policies, since it is now recognised that nutrition issues cannot be addressed by the health and agricultural sectors alone. In recognising the need for a multi-sectoral approach, the government has formulated, through its organ the Tanzanian Food and Nutrition Centre and in collaboration with other sectors, a Food and Nutrition Policy that is to be implemented as the National Plan of Action for Nutrition. Undoubtedly future progress in improving the nutritional situation in Tanzania will largely depend on what is currently being done at various levels as well as the implementation of workable recommendations from various sectors, as stipulated in the National Plan of Action for Nutrition.

J Kinabo

J Msuya

*Department of Food Science and Technology
Sokoine University of Agriculture
Morogoro
Tanzania*

1. Ministry of Health Tanzania and Bureau of Statistics and Marco International, Claverton, Maryland, USA. Tanzania Demographic and Health Survey, 1998.
2. UNICEF. *The State of the World's Children*. Oxford: Oxford University Press, 1999. www.unicef.org
3. Peter C, Niemeijer R. *Protein Energy Malnutrition and the Home Environment*. Food and Nutrition Studies Programme. Netherlands: African Studies Centre, 1987: 22.
4. Ministry of Health Tanzania and Bureau of Statistics and Marco International, Claverton, Maryland, USA. Tanzania Demographic and Health Survey, 1996.
5. UNICEF. *The State of the World's Children*. 2001. www.unicef.org
6. Msuya, JM. Nutrition Improvement Projects in Tanzania: Implementation, determinants of performance and policy implications. Development Economics and Policy. Thesis, ed. Heidhues F, Braun J, Peter Lang, 1999: 140-160.
7. Kavishe FP. The food and nutrition situation in Tanzania. TFNC Report No. 1215. 1987.
8. Kavishe, FP. Child nutrition. TFNC Report No. 887. 1987.
9. Kimati VP, Scrimshaw NS. The nutritional status of Tanzanian children: a cross-sectional anthropometric survey report. *East Afr Med J* 1985; **62**: 105-117.
10. Senderowitz J. Adolescent health: Reassessing the passage to adulthood. World Bank Discussion Paper. Washington, DC: World Bank, 1995: 272.
11. Golub S. *Periods, from Menarche to Menopause*. London. Sage Publications, 1992.
12. Kinabo JL, Kissawike K, Msuya J. Factors influencing birth weight in Morogoro municipality, Tanzania. *SAJFSN* 1997; **9** (1): 3-8.
13. Kimati VP, Scrimshaw NS. The nutritional status of Tanzanian children: a cross-sectional anthropometric survey report. *E Afr Med J* 1985; **62**: 105-117.
14. Kitange H. Recent developments of non-communicable diseases in Tanzania. 17th NIMR Annual Joint Scientific Conference and Symposium on Changes in Disease Patterns and Health Systems: Which Way Africa. Arusha, Tanzania, 2000.
15. Tanzania Demographic and Health Survey. Ministry of Health, Tanzania, and Bureau of Statistics and Marco International, Claverton, Maryland. 1997.
16. Kavishe FP. Nutrition Relevant Actions in Tanzania. Tanzania Food and Nutrition Centre. Monograph Series No. 1. 1993.
17. Kinabo, JLD. Birth weight distribution in Morogoro, Tanzania. *E Afr Med J* 1993; **70**: 752-759.
18. Mwaluko GMP, Kilama WL, Mandara PM, Murru M, MacPherson CNL. *Health and Diseases in Tanzania*. Harper Collins, 1991.
19. Tanzania Demographic and Health Survey. Ministry of Health, Tanzania and Bureau of Statistics and Macro International, Claverton, Maryland 1996.
20. Msolla MJ, Kinabo JLD. Prevalence of anaemia in the last trimester of pregnancy. *IJFSN* 1997; **48**: 265 - 270.
21. TFNC. Tanzania nutrition trends: Nutrition surveillance report. No. 001. TFNC Report No. 1318. 1990.
22. Mugyabuso JKL, Ruhiye DRM, Ballart A. Vitamin A supplementation system. TFNC Report No. 1881. 1998.
23. Sanga AB. Preliminary report on evaluation of IDD control Programme in Tanzania. TFNC Report No. 1905. 1999.
24. Health Statistics Abstracts. Ministry of Health. Mortality and morbidity. 1998; **6** (1).
25. Setel P, Hemed Y, Whiting D, Masanja H, Lewanga M, Mswia R, Kitange H. The worst of the two worlds: Adult mortality in Tanzania. *Insights Health Issues* 2001; **1**: 1-4. www.id21.org/insights.
26. AIDS Economics. Tanzania AIDS Assessment and Planning Study. World Bank, 2000: 1-20. www.worldbank.org/aids-econ/tanz-report.
27. AIDS CAP. Epidemiology of HIV/AIDS and other STIs. www.fhi.org/en/aids/aids-cap/tanzania. 1998.