

## CO-EXISTENCE OF OVER AND UNDERNUTRITION RELATED DISEASES IN LOW INCOME, HIGH-BURDEN COUNTRIES: A CONTRIBUTION TOWARDS THE 17TH IUNS CONGRESS OF NUTRITION, VIENNA AUSTRIA 2001

R. Rutengwe, W. Oldewage-Theron<sup>2</sup>, R. Oniang'o<sup>3</sup> and H.H. Vorster<sup>4</sup>

### ABSTRACT

Adequate nutrition is a basic human right, but globally it remains unmet for many pre-school children. Poverty, food insecurity and malnutrition continue to be obstacles to human rights, quality of life and dignity. The 1995 goal to eradicate poverty in the world by 2020 is not on target in developing countries; rather, poverty has been increasing. Over 800 million people suffer from malnutrition in developing countries and over 20 % of the populations are hungry.

About one third of the world's population suffer from micronutrient deficiencies and hundreds of millions suffer from chronic diseases of lifestyle. Prevalence rates, particularly low birth weight, stunting and underweight, remain high particularly in Eastern Africa and South Central Asia. More than a third of all children in developing countries remain constrained in their physical growth and cognitive development. The 1990 ambitious goal of halving childhood underweight prevalence by the year 2000 has not been achieved by most countries. Global progress in fighting malnutrition is slow and crippled by rapid increase of both communicable and non-communicable diseases, the so-called "double burden of disease". About 115 million people suffered from obesity related diseases in the year 2000. Overweight and obesity (globesity) prevalence is advancing rapidly in developing countries.

### GLOBAL OVER- AND UNDERNUTRITION SITUATION

Adequate nutrition is a basic human right and embedded in the constitution of most developing countries. This remains unmet for vast numbers of pre-school children throughout the world, despite the general improvement in food production, health conditions, and increased availability of educational and social services(1). The focus on human capabilities has opened the door for the human rights- based approach to development.

Poverty, food insecurity and malnutrition are still

Cardiovascular diseases (CVD), myocardial infarction, angina pectoris and stroke as one of the most important causes of mortality and morbidity globally, will continue to be first and second leading causes of death in the world. Most developing countries, including South Africa, currently are in the process of transition and experiencing the double burden of both communicable and non-communicable diseases in which chronic diseases of lifestyle such as CVD have emerged while the battle against infectious diseases has not been won. In the last few years the HIV/AIDS epidemic has spread extremely rapidly and is likely to double overall mortality rates, undermine child survival and halve the life expectancy over the next five years.

The co-existence of over- and under-nutrition calls for urgent innovative strategies and interventions to tackle the problem. The importance of prevention as the most sensible strategy is emphasised. This overview emphasises that, in planning nutrition strategies and interventions in low income, high-burden countries such as South Africa risk factors for both over- and under-nutrition and related diseases should be targeted and addressed.

*Keywords:* over- and under-nutrition, double burden of disease and developing countries.

obstacles to human rights, quality of life and human dignity. "Poverty breeds malnutrition and, in turn, malnutrition increases poverty, thus a vicious circle"(2). The concentration and increasing number of poor people in cities makes food insecurity an extremely pressing social and political issue. By contrast in 1993, 43 % of the South Asian population, 26 % in East Asia and the Pacific (including China) and 24 % in Latin America lived in poverty; at 39% at the time, even sub-Saharan Africa (SSA) had slightly lower incidence of poverty(3). Today, about 50 % of the urban population in SSA live in poverty and in Latin America about 40 % of all urban households are poor. Therefore, improved food security is essential for attaining a safer and more stable social climate in developing countries(4). The challenge now is how best to operationalise the principles of human rights in food and nutrition security programming.

By contrast during the 20th century, 826 million people were malnourished with 792 million in developing countries

<sup>1</sup>Corresponding author. Master's Student, Vaal Triangle Technikon, Faculty of Humanities, Department of Hospitality and Food Consumer Science, Private Bag X021, Vanderbijlpark 1900, South Africa. E-mail: rutengwe@hotmail.com, Cell phone 0722-137 391.

<sup>2</sup>Lecturer and Head of Department, Department of Hospitality and Food Consumer Science, Vaal Triangle Technikon, Private Bag X 021, Vanderbijlpark 1900, South Africa.

<sup>3</sup>Professor of Food Science and Nutrition, Jomo Kenyatta University of Agriculture and Technology, P.O. Box 62000, Nairobi, Kenya.

<sup>4</sup>Professor and Director of Research, Department of Nutrition, Potchefstroom University of Christian Higher Education, South Africa.

and 34 million in developed countries. Today, more than 800 million people suffer from malnutrition in developing countries and more than 20 % of the populations are hungry(5-7). In 1995 malnutrition was associated with 6,6 million of the 12,2 (54 %) million deaths in the under-fives in developing countries(8-9). UNICEF estimated that 190 million children under-fives in the developing countries are chronically malnourished and are trapped early in life in a pattern of poor health and development(6,7-10). The prevalence of stunting in developing countries affects 48 % of children in South Central Asia, 48 % in Eastern Africa, 38 % in Southeast Asia, and 13 % to 24 % in Latin America (Stephenson *et al.*, 20009). About 30 million infants are born each year in developing countries with impaired growth due to poor nutrition during foetal life(11).

In SSA, the actual number of underweight malnourished children has risen (Table 1.1) due to poverty, natural disasters, civil wars and population displacement. Wasting is observed not to be common as stunting or underweight in any region. The rates, however, can change rapidly, especially in situations of emergency. However, 76 % of malnourished children globally live in Southern Asia, while 21 % are found in SSA and only 3 % in Latin America(12).

Table 1.1

Global prevalence of stunting, underweight and wasting of children under-fives, by UN-regions in 1980, 1995, 2000 and 2005(13)

UN-regions	*Stunting			*Underweight			*Wasting
	1980	2000	2005	1980	2000	2005**	1995
Africa	40.5	35.2	33.8	26.2	†28.5	†29.1	9.6
Asia	52.2	34.4	29.9	43.9	6.3	4.3	10.4
Latin America and Caribbean	25.6	12.6	9.3	14.2	6.3	4.3	2.9
All developing countries	47.1	32.5	29.0	37.4	26.7	24.3	9.4

\* Defined as -2 SD from norm, †=increasing, \*\* Projections

About 2,000 million people (a third of the world's population) experience micronutrient deficiencies, especially vitamin A deficiency (VAD). Subclinical deficiencies affect 250 million pre-school children and unknown numbers of school- aged children, adolescents and pregnant women. Iron deficiency anaemia (IDA) remains a huge problem, affecting over 3,5 billion people, especially pre-school children and pregnant women. Globally, 68 % of households in countries with iodine deficiency disorders (IDD) now consume iodised salt. The global goal of virtual elimination of IDD is within reach.

On another level, hundreds of millions suffer from nutrition-related diseases of lifestyle(1,11,14). According to Gardner(15) the hungry and the overweight share high levels of sickness and disability, shortened life expectancies, and lower levels of productivity. All of these factors affect a country's development negatively. Among adults, both over- and under-nutrition are present in many developing countries. While underweight is particularly common among women in South Central

Asia, both under- and overweight are observed in African women. In the Caribbean and Latin America, overweight affects up to one in four women(13). Although the world's undernourished population has declined slightly since 1980 to 1,1 billion, the number of overweight people has surged to 1,1 billion, hence confirming the "double burden of disease" phenomenon.

In the low income, high-burden countries, about 115 million people suffered from obesity related diseases in the year 2000. About 15 % of deaths in these countries are due to cardiovascular diseases(16,17).

For the first time in human history, the number of overnourished people rivals the number of undernourished people. This implies that the population of overweight people has expanded rapidly in recent decades, more than balancing the advantageous benefits from the modest decline in hunger. Overweight and obesity (globesity) prevalence is advancing rapidly in low-income countries(14,18-22). In Brazil and Colombia, for example, 36 % and 41 % respectively, of the population is overweight. Halweil (2000)23 recently stated that nations often simply traded hunger for obesity, and diseases of poverty for diseases of excess. While still struggling to eradicate communicable diseases, many of these countries' health care systems could be crippled by growing caseloads of non-communicable diseases such as CVDs(23).

The current lack of consistency and agreement between different studies over the classification of obesity in children and adolescents makes it difficult to give an overview of the global prevalence of obesity for younger age groups(24). Nevertheless, whatever classification system has been used, studies investigating obesity during childhood and adolescence have reported increasing prevalence of obesity(14,24-26). Furthermore, nationally representative data from 79 developing and some developed countries suggest that, by WHO standards (>+2SD above median weight for height) and body mass index (BMI) >30 kg/m<sup>2</sup>, about 22 and 200 million children under-fives and adults are overweight respectively(12). Table 1.2 shows global prevalence of overweight children under-fives and adults, by WHO regions in 1995.

Table 1.2

Global prevalence of overweight children under-fives and adults, by WHO regions in 1995(12)

WHO regions	Children (>+2SD above median weight for height)		Adults (BMI>30 kg/m <sup>2</sup> )	
	Prevalence (%)	No. (million)	Prevalence (%)	No. (million)
Africa	2.7	2.8	2.0	5.1
Southeast Asia	0.6	1.0	0.8	6.3
Eastern Mediterranean	4.4	3.2	3.5	6.3
Americas	4.6	3.6	17.4	82.7
Europe	n.a	n.a	12.4	76.1
Western Pacific	3.7	5.2	2.5	26.4
Global	3.6	21.9	6.0	203.4

Overweight is defined as (>+2SD from norm), n.a = data not available BMI = body mass index (body weight in kg/ height in m<sup>2</sup>)

Globally, the burden of disease shows that the poorest 20 % of the world's population experience higher death rates than the richest and it was estimated that 70 % of the deaths amongst the poor could be excessive if they had experienced the same death rates as in the developed countries. In particular, over 90 % of the deaths due to infectious diseases and maternal causes and 32 % of the deaths due to non-communicable diseases, could be considered as excessive(27,28).

Cardiovascular diseases (CVD), coronary/ischaemic heart diseases (CHD)/(IHD), myocardial infarction, angina pectoris and stroke are and will continue to be the leading causes of death in the world. About 50 million people die each year of whom over 11 million succumb to the two main forms of CVD; namely CHD and cerebro-vascular accident (CVA) or stroke, with CHD the most important(29-32). Both developed and low-income, high-burden countries are affected. Moreover, as the problem appears to be increasing rapidly in children as well as in adults, the true health consequences may only become fully apparent in the distant future(12). In developed countries, CVD accounts for about 40 % of all causes of death. In the low-income, high-burden countries this figure is nearly 25 %(33).

Table 1.3 provides the world situation on two major forms of CVD. Ischaemic heart disease ranks number one and accounts for 12 % of deaths, varying from 12 % in men to 13 % in women. Stroke, which ranks second, accounts

for 21 % of deaths, varying from 23 % in women to 28 % in men. The prevalence data for developing regions indicate higher percentages of 19 % for IHD and 26 % for stroke.

In Table 1.4 the percentages of deaths caused by IHD and CVA by regions and world in 1990 show IHD still ranks top and accounts for 26 % of deaths in SSA to 53 % in established market economies (EME). Stroke accounts for 16 % of deaths in the Middle Eastern crescent (MEC) to 50 % in China (CHN).

The data in Tables 1.3 and 1.4 imply that developing countries face a bigger challenge to reduce the double burden of over- and under-nutrition related diseases. Hence, determined efforts in terms of political choice and commitment in a democratic world(34), allocating adequate resources to what works best, reviewing and reformulating well targeted health, nutrition and food security policies will be a prerequisite in the next two decades. Strengthened integration between health and agriculture sectors to have coherent plans of actions must be emphasised. This has been the frequent failure in many developing countries. In addition to the above processes, increased community mobilisation and participation and consumer education should be included. This will facilitate low-income, high-burden countries to improve their programme planning and development strategies towards 2020. Experiences of these countries in the fight against undernutrition and micronutrient deficiencies show that rapid progress is possible if these elements are put in place(11).

**Table 1.3**

*Deaths caused by CVD by world, developed & developing countries and gender 1990 (29-30)*

Regions	CVD	Both sex						Women		
		Rank	Death '000	Cum. %	Rank	Death '000	Cum. %	Rank	Death '000	Cum. %
World	IHD	1	6260	12.4	1	3126	11.7	1	3134	13.2
	CVA	2	4381	21.1	3	2022	27.5	2	2359	23.1
Developed Countries	IHD	1	2695	24.7	1	1297	23.3	1	1398	26.1
	CVA	2	1427	37.8	2	561	33.4	2	867	42.4
Developing Countries	IHD	2	3565	18.9	2	1829	18.2	2	1736	19.7
	CVA	3	2954	26.4	4	1461	32.4	3	1492	27.8

CVD = Cardiovascular disease, CVA = Cerebro-vascular accident/stroke, IHD = Ischaemic heart disease

**Table 1.4**

*Percentage of deaths caused by IHD and CVA by regions and world 1990(29)*

Form of CVD	Regions								
	EME %	FSE %	IND %	CHN %	OAI %	SSA %	LAC %	MEC %	World %
IHD	52.5	49.6	51.9	29.7	34.2	25.6	44.1	47.1	43.7
CVA	24.8	30.9	19.8	49.5	28.9	47.0	31.5	16.3	30.6

EME = Established Market Economies, FSE = Former Socialist Economies of Europe  
 IND = India, CHN = China, OAI = Other Asia and Islands,  
 SSA = Sub-Saharan Africa, LAC = Latin America and the Caribbean  
 MEC = Middle Eastern Crescent, IHD = Ischaemic heart disease  
 CVD = Coronary heart disease, CVA = Cerebro-vascular accident

Table 1.5

*Co-existence of percentage DALYs among nutritional deficiencies and CVA by regions 1990(38)*

Cause	Regions								
	EME %	FSE %	IND %	CHN %	OAI %	SSA %	LAC %	MEC %	World %
All forms of nutritional deficiencies	0.9	1.0	4.2	4.6	4.5	3.2	3.7	4.7	3.7
All forms of CVD	18.6	23.2	8.2	11	10.1	3.9	8.0	11.1	9.7

DALY = Disability Adjusted life Year,  
 FSE = Former Socialist Economies of Europe,  
 OAI = Other Asia and Islands,  
 LAC = Latin America and the Caribbean,  
 CVD = Cardiovascular diseases  
 EME = Established Market Economies  
 IND = India, CHN = China,  
 SSA = Sub-Saharan Africa,  
 MEC = Middle Eastern Crescent

According to Murray & Lopez(35) CHD and CVA will remain the first and second leading causes of death worldwide by the year 2020. This is mainly because of increases expected in low income, high-burden countries experiencing urbanisation and changing lifestyles of traditional people. Indeed by 2025 about half of the SSA population will be living in urban areas while the number of Africans, aged over 60 years, will increase from the present 39 million to 80 million(6,36). Shetty(37) suggested that overnutrition-related chronic diseases such as obesity, diabetes mellitus, CVD and certain forms of cancer in developing countries, have set in before the battle against undernutrition has been won.

Table 1.5 provides global data on co-existence of nutritional deficiencies and CVD. Globally, CVD accounts for 10 % of disability adjusted life years (DALYs), but this proportion varies enormously from 4 % in SSA to 23 % in the former socialist economies of Europe (FSE). All the nutritional deficiencies account for a global prevalence of 3.7 % varying from 0.9 % in established market economies (EME) and 1% FSE to 4.6 % in China (CHN) and 4.7 % middle eastern crescent (MEC) respectively.

The fact that most low income, high-burden countries faced high prevalence of morbidity and mortality due to malnutrition related diseases in the last century, has led to several global initiatives and political commitments, spearheaded by a number of United Nations Organisations, to eradicate poverty and reduce hunger, undernutrition, food insecurity, starvation and micronutrient deficiencies. Some of these international initiatives were:

- The 1990 World Summit for Children (WSC) with an agenda to reduce severe and moderate malnutrition among pre-school children by 50 % of the 1990 rates by the year 2000, including goals for virtual elimination of micronutrient malnutrition.
- The 1992 International Conference on Nutrition (ICN) reinforced earlier goals and extended them to eliminate death from famine.
- The 1995 World Summit for Social Development (WSSD) had national leaders committing to eradicate

poverty in the world, to take decisive national actions and international co-operation, as an ethical, social, political and economic imperative of humankind. Attention should be focused on and support the special needs of countries and regions in which there are substantial concentrations of people living in poverty, in particular in South Asia and which therefore face serious difficulties in achieving social and economic development.

At national level, all agreed to focus the efforts and policies to address the root causes of poverty and to provide for the basic needs of all. These efforts included the elimination of hunger and malnutrition; the provision and assurance of food security, education, employment and livelihood, primary health care services including reproductive health care, safe drinking water and sanitation, and adequate shelter; and participation in social and cultural life. Special priority would be given to the needs and rights of women and children, who often bear the greatest burden of poverty, as well as the needs of vulnerable and disadvantaged groups and persons. The 2020 initiative encouraged governments in developing countries and donors to devote 20 % of their expenditures to basic social services. Many governments continue to be involved in working towards this goal. Such commitments will assist in providing the needed financial support for community based-programmes.

- During the 1996 World Food Summit (WFS) 186 Heads of States and Governments pledged their political will and commitment to a Plan of Action to reduce the number of undernourished people to half their 1996 number by 2025. The summit endorsed the 1992 ICN recommendations and incorporated these into the WFS Plan of Action and the Rome declaration on WFS.
- The 1997 establishment of the Food Insecurity and Vulnerability Information and Mapping System (FIVIMS) and their Internal Agency Working Group

(IAWG) which consisted of 26 International organisations and agencies with a shared commitment to reduce food insecurity and vulnerability and its multidimensional causes in poverty.

The prevention of malnutrition and its negative effects on the quality of individual and community life, together with the implications for national productivity and socio-economic development, therefore, amount to the strongest argument for any government to afford this highest priority(10,17). Social and political development cannot occur without an adequately nourished, healthy and productive nation(17,39). Most countries simply do not make nutritional well being a priority. By January 1996, 98 developing countries had national plans of action for nutrition and 41 countries had one under preparation, in keeping with the commitment made at the ICN in Rome in December 1992(5). Even countries struggling with difficult economic and political circumstances can significantly reduce the number of undernourished people with the right policies. Cuba and India, for example, have been remarkably successful at reducing undernutrition by targeting nutritionally vulnerable populations such as women and children with special programs. Both governments provide broad access to healthcare, an important partner to food intake in ensuring adequate nutrition(23).

#### THE OVER- AND UNDERNUTRITION SITUATION IN EASTERN AFRICA

The major undernutrition related problems of public health importance in the Eastern Africa are Protein-Energy-Malnutrition (PEM) and micronutrient malnutrition particularly vitamin A deficiency (VAD), iron deficiency anaemia (IDA), iodine deficiency disorders (IDD) and zinc deficiency. These problems exist throughout the lifecycle(11). In the year 2000, about 48,1 % of pre-school

children were stunted and this ranked the sub-region with highest prevalence rate of stunting in the world (Oniang'o & Mutuku, n.d). 41 The data in Table 1.6 suggest that the average prevalence of undernutrition in Eastern Africa in the year 2001 accounts 31 % for underweight, wasting 8,9 % and stunting 38,5 %. At country level underweight varying from 47 % in Eritrea to 24 % in Zambia and 9 % in South Africa. Wasting varies from 16 % in Eritrea to 4 % in Zambia and 3 % in South Africa. Stunting still ranks first, with prevalence varying from 51 % in Ethiopia to 14 % in Somalia and 23 % in South Africa. Low birth weight (LBW) prevalence varies from 20 % in Malawi to 13 % in Uganda, Zambia and Eritrea. The average percentage of urbanised population in the sub-region is 19.3 % far below compared to 50 % in South Africa.

Micronutrient deficiencies of VAD, IDA and IDD continue to record high prevalence in the sub-region without any significant hope of amelioration. Vitamin A Deficiency leads to childhood deaths from infections and is the most cause of preventable blindness in children. Iron deficiency anaemia increases the risk of poor pregnancy outcome including prematurity, LBW and maternal mortality. Iodine Deficiency Disorders impairs physical and mental development, including intellectual capacity(44). It appears that ongoing interventions have not had the desired effects.

Published information on overnutrition related diseases in the Eastern Africa are scarce. According to(45), for example in Uganda, there was no national data available on the prevalence of overweight/obesity, weight gain during pregnancy or energy intake. This calls for more research to establish the magnitude of the problem in the sub-region. Nevertheless, like any other developing countries of the world, this sub-region also currently experiences rapid transition of urbanisation and change of lifestyle that result in increased non-communicable diseases. In a study that investigated the risk factors of

Table 1.6

Comparison of prevalence of undernutrition, LBW, under-fives and urbanised population in the Eastern Africa and South Africa(42,43)

Country	Moderate and severe U/wt (%)		Moderate and severe Wasting (%)		Moderate and severe Stunting (%)		LBW (%)		U5 pop (millions) 2001	Urbanised pop (%) 1993
	1980-93	'01	1980-93	'01	1980-93	'01	1990	'01		
Tanzania	29	27	7	6	47	42	14	14x	5.7	23
Kenya	22	22	6	6	33	33	16	16x	4.5	26
Uganda	23	26	2	5	45	38	n.a	13	4.3	12
Ethiopia	48x	47	8x	11	64x	51	16	16x	1.1	13
Zambia	25	24	5	4	40	42	13	13x	1.6	43
Malawi	27	30	5	7	49	48	20	20x	2.0	13
Sudan	20	3x	14	13x	32	33x	15	15x	4.2	24
Somalia	n.a	26	n.a	12	n.a	14	16	16x	2.0	25
Eritrea	n.a	44	n.a	16	n.a	38	n.a	13x	0.6	n.a
Rwanda	29	27	4	9	48	42	17	17x	1.3	6
Burundi	38x	3x	6x	9x	48x	43x	n.a	n.a	1.2	8
Eastern Africa(all)	29	31	6.3	8.9	45	38.5	15.9	15.3	38.4	19.3
South Africa	n.a	9	n.a	3	n.a	23	n.a	n.a	4.9	50

U/wt= underweight, n.a= data not available, pop= population, U5 pop= under-fives population, x= data that refer to years or periods other than those specified in the column heading, differ from standard definition, or refer to only part of a country

CVD in Tanzanian Africans (10,037 subjects, both men and women) in four provinces of Dar-es-Salaam, Mara, Kilimanjaro and Morogoro(46) suggested that in the population studied, the prevalence of risk factors for CVD were much lower than in the developed countries.

### THE OVER- AND UNDER-NUTRITION SITUATION IN SOUTH AFRICA

Over- and under-nutrition related diseases continue to be the biggest contributors to child morbidity and mortality in South Africa(27). About 2.3 million people were considered to be in need of nutritional assistance in 1989. Ninety two percent were children under 12 years of age and 8 % were pregnant and lactating women(47). In 1989, about 68.3 % of blacks lived in rural areas and in total 44.8 % of the population lived below the poverty line. A review of poverty in South Africa(48,49) showed that a large proportion of the population was living in poor conditions and that poverty was highly correlated with population group. About 61 % of blacks, 38 % of coloureds, 5 % of Asians and 1 % of whites fell below the poverty line(27,50-51). Today, about 57 % of the South African population are living in poverty, 39 % of the population is vulnerable to food insecurity and only 25 % of households appear to be food secure(52).

The co-existence of over- and under-nutrition related diseases in South Africa is evident from the high prevalence of micronutrient deficiencies and very high prevalence of obesity in black women(53), as well as stroke (54) and hypertension(55) in urban Africans. Vorster *et al.*(56). When they used the South African age-specific limits for low, medium and high CHD risk levels to categorise black South Africans participating in the THUSA study showed that more subjects 309 (17%) in group three (G3) and 190 (11 %) in group five (G5), fell into high risk of CHD. Group three represented informal settlement dwellers; people in the most rapid phase of transition, and group five represented upper class urban dwellers. Bradshaw *et al.*(57) indicated that mortality rates due to

IHD were the highest among the Asians and whites.

Seftel *et al.* (58) suggested that information on CHD was not ideal. There were no comprehensive lipid profiles by gender and age in the different population groups, performed simultaneously using standardised methodology. Therefore, it was recommended that more surveys of lipid and other CHD risk factors in urban and rural areas should be done. This was because CHD mortality rates appeared to be substantially higher among metropolitan coloureds than among their rural counterparts. In South Africa about 12,000 individuals die annually from CHD or peripheral vascular disease events, but about three times as many survive. Also, about 20 % of westernised adults had total cholesterol (TC) levels that put them in high risk of CHD(58).

According to Vorster *et al.* (59) the high incidence of CHD has important economic implications for South Africa. Pestana *et al.* (60) estimated that excluding rehabilitation and follow-up visits, CVD costs South Africa between 4.1 and 5 billion Rand. Oosthuizen(61) emphasised that CVD is a major public health problem in South Africa.

Developing countries such as South Africa are currently in the process of transition experiencing the double burden of both communicable and non-communicable diseases(27,62,63) in which chronic diseases of lifestyle such as CVD have emerged while the battle against infectious diseases is still being fought. The chronic diseases of lifestyle are related to over-nutrition, infectious diseases, under-nutrition and poverty. In the last few years the HIV/AIDS epidemic has spread extremely rapidly and is likely to double overall mortality rates, undermine gains in child survival and halve the life expectancy over the next few years(64).

The National Food Consumption Survey (NFCS) (1999) (65) found that 7.7 % of children in the one- to nine year age groups were overweight in the formal urban areas with a higher prevalence among children of well-educated mothers (12.5 %). The 1998 South Africa Demographic Health Survey (66) found that 29 % of adult

Table 1.7

Prevalence of undernutrition of children aged one to nine years South Africa(64)

Undernutrition (%)	Commercial farms	Formal Urban	Informal Urban	Tribal	Rural	Urban	National
*Stunting	30.6	16	19.3	25.6	26.5	17	21.6
*Underweight	18	8	8	13	13	8	10
*Wasting	4	2.6	2	5	5	2.5	4

\* Defined as -2 SD from normal

men and 55 % of adult women were overweight while 9 % of adult men and 29 % of adult women were obese. Shung-King *et al.* (67) and Labadarios (64) indicated that 30.6 % of children between the ages of one to nine years were stunted. Younger children, one to three years of age, were most severely affected as well as those living on commercial farms (30,6 %) and tribal and rural areas. Nationally, underweight affected 10 % of children in this age group and 18 % on commercial farms. Wasting is not common in South Africa as it affects only 4 % of children between the ages of one to nine years (Table 1.7).

Micronutrient deficiencies are prevalent in South Africa and mostly affect vulnerable groups such as women and children (64). Vorster *et al.* (68) suggested that many adults and adolescents suffer from micronutrient malnutrition, notably vitamin A and iron deficiencies.

### SOME NUTRITION STRATEGIES TOWARDS 2020

The co-existence of over- and under-nutrition, leading to a double burden of malnutrition related diseases call for urgent innovative strategies and interventions to tackle the problem, which now affects developing and developed countries alike, in integrated public health and nutrition

promoting programmes. These programmes should use approaches that focus on optimal nutrition for all. Strengthened community nutrition programmes, multi-centre research and training activities will continue to be more important in order to draw and replicate the "success factors or better practices". The importance of prevention as the most sensible strategy in low income, high-burden countries is emphasised (69). "Resources put into nutrition are an investment with significant returns, today and in the future" (70)

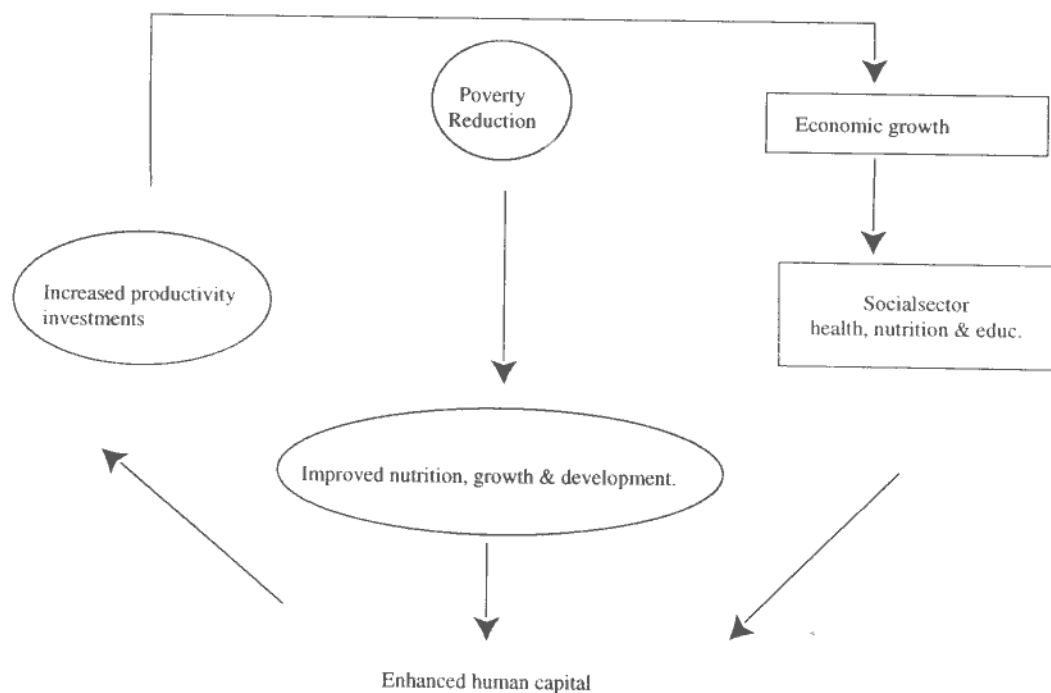
Figure 1.1 illustrates the links between improving nutrition and promoting economic growth. About half of the economic growth achieved by the United Kingdom and a number of Western countries between 1790 and 1980, has been attributed to better nutrition and improved health and sanitation conditions, social investments made as much as a century earlier (71).

### CONCLUSIONS

The data presented in this overview emphasise that, in planning nutrition strategies and interventions towards 2020 in low income, high-burden countries such as South

Figure 1.1

Health, nutrition and economic growth. (Adapted from UN ACC/SCN, 1995) 71





Africa, risk factors for both over- and undernutrition related diseases should be targeted and addressed. Further, whereas the situation may not be the same in other SSA countries, it is only a matter of time before the impact of the double burden begins to be felt, if appropriate measures are not put in place now.

## REFERENCES

- SALOOJEE, H. & PETTIFOR, J. M.** Malnutrition. (Available at <http://www.wits.ac.za/fac/med/peadiatrics/training/lecturetime5/malnutrition.htm>) 6/14/01. (2001).
- HORWITZ, A.** (1995). An interview in SCN news No. 13. In: Osmani, S. R. (1997). Poverty and nutrition in South Asia. In: Nutrition and poverty: Papers from the ACC/SCN 24th Session Symposium, Kathmandu. 23-51.
- OSMANI, S. R.** (1997). Poverty and nutrition in South Asia. In: Nutrition and poverty: Papers from the ACC/SCN 24th Session Symposium, Kathmandu. 23-51.
- FAO.** FAO warns of increasing malnutrition among urban poor. Press Release 01/36. (Available at [http://www.fao.org/WAICENT/OIS/PRESS\\_NE/PRESSENG/2001/pren0136.htm](http://www.fao.org/WAICENT/OIS/PRESS_NE/PRESSENG/2001/pren0136.htm)) 6/14/01. (2001).
- WHO.** Child malnutrition. Fact sheet No. 119. (Available at <http://www.who.int/inf-fs/en/fact119.html>). 6/14/01. (1996).
- IYENGAR, G. V. and NAIR, P. P.** Global outlook on nutrition and the environment: meeting the challenges of the next millennium. *Sci Total Environ*: 249 (1-3): (2000): 331-46. (Available at <http://www.ncbi.nlm.nih.gov/80/entrez/quicksearch.html?pubmed=10813462&dopt=Abstract>) 06/07/2001.
- OLDEWAGE-THERON, W. H.** Evaluation of the fortification of sugar with vitamin A. Potchefstroom: Potchefstroom University for Christian Higher Education, Thesis-PhD. (2001).
- BELAMY.** South African Vitamin A Consultative Group (SAVACG) 1996. (1997).
- STEPHENSON, L. S. , LATHAM, M. C. & OTTESEN, E. A.** Global malnutrition. *Parasitology*: 121. Suppl: S5-22. (2000). (Available at <http://www.ncbi.nlm.nih.gov/80/entrez/quicksearch.html?pubmed=11386691&dopt=Abstract>) 06/07/2001.
- SAVACG** (South African Vitamin A Consultative Group). Children aged 6 to 71 months in South Africa, 1994: their anthropometric, vitamin A, iron and immunisation coverage status. Isando: SAVACG. (1995): 335).
- UN ACC/SCN.** Fourth Report on The World Nutrition Situation: Nutrition Through the Life Cycle. Geneva: ACC/SCN in collaboration with Food Policy Research Institute (IFPRI). (2000a): 1-114).
- ANON.** Report: Malnutrition worldwide. (2001: 1-13). (Available at [http://www.mikeschice.com/reports/malnutrition\\_worldwide.htm](http://www.mikeschice.com/reports/malnutrition_worldwide.htm)). 6/14/01.
- UN ACC/SCN.** Executive summary: Main messages of the commission report. S. I: Geneva. (2000b: 2).
- HOLMBOE-OTTESEN, G.** Global trends in food consumption and nutrition. *Tidsskr Nor Laegeforen*: (12091): (2000): 78-82. (Available at <http://www.ncbi.nlm.nih.gov/80/entrez/quicksearch.html?pubmed=10815492&dopt=Abstract>) 06/07/2001.
- GARDNER, G.** Chronic hunger and obesity epidemic eroding global progress. A. WWI press release. (2000). (Available at <http://www.worldwatch.org/pubs/paper/150.htm>). 6/14/01.
- WHO.** World health statistics annual 1991. Geneva, WHO. 1: (1992): 159-168).
- FERNANDO, D. J. S. , SIRIBADDANA, S. H. , DE SILVA, D. R. & PERERA, S. D.** The prevalence of obesity and other coronary risk factors in a suburban Sri Lankan community. *Asia Pacific J Clin Nutr*, 3: (1994): 155-159).
- WHO** (World Health Organisation). Expanded programme on immunisation (EPI): using national immunisation days to deliver vitamin A. *EPI update*, (33): (1998: 1-4), Nov.
- TAUBES, G.** As obesity rates rise, experts struggle to explain why. *Science* 280: (1998: 1367-1368).
- TROIANO, R. P. and FLEGAL, K. M.** Overweight children and adolescents: description, epidemiology, and demographics. *Paediatrics*. 101 (Suppl): (1998: 497-504)
- WHO.** Obesity: Preventing and managing the global epidemic. Report of a WHO Consultation. WHO technical report series, no. 894. (2000a).
- HOWARTH, N. C. , SALTZMAN, E. , and ROBERTS, S. B.** Dietary fibre and weight regulation. *Nutrition review*. 59 (5): (2001: 129-139).
- GARDNER, G. & HALWEIL, B.** A world watch paper 150. The Underfed and Overfed: The global epidemic of malnutrition. (2001). (Available at <http://www.worldwatch.org/pubs/paper/150.html>) 6/14/01.
- DE ONIS, M. and BLOSSNER, M.** Prevalence and trends of overweight among preschool children in developing countries. *Am J Clin Nutr* 72 (4): (2000: 1032-1039) (Available at <http://www.ncbi.nlm.nih.gov/80/entrez/quicksearch.html?pubmed=11010948&dopt=Abstract>) 06/07/2001.
- McLennan, W. and PODGER, A.** National Nutrition Survey Nutrient Intakes and Physical Measurements. Canberra: Australian Government Publishing Service. (1998).
- MAGAREY, A. M. , DANIELS, L. A. , BOULTON, T. J. C. and COCKINTON, R. A.** Does fat intake predict adiposity in healthy children and adolescents aged 2-15 y? A longitudinal analysis. (2001).
- BRADSHAW, D.** The Broad Picture: Health Status and Determinants. In: Barron, P. (Ed). South African Health Review 1997. Health Systems Trust. Durban. 1997. (1997).
- GWATKIN, D. R. and GUILLOT, M.** The Burden of Disease among the Global Poor. Current situation, Future Trends and Implications for Strategy. The International Bank for Reconstruction and development/The World Bank. Washington. (2000).
- MURRAY, C. J. L. and LOPEZ, A. D.** Estimating causes of death: new methods and global and regional application. In: MURRAY, C. J. L. & LOPEZ, A. D. Eds. The global burden of diseases. S. I: Harvard School of public Health on behalf of the WHO and the World Bank. (1996a: 178-180).
- MURRAY, C. J. L. and LOPEZ, A. D.** Mortality by cause for eight regions of the world: Global burden of disease study. *Lancet*: 349(9061): 1269-76. (Available at <http://www.ncbi.nlm.nih.gov/80/entrez/quicksearch.html?pubmed=9142060&dopt=Abstract>) 06/07/2001. (1997).
- WHO-MONICA.** WHO-Monitoring trends and determinants in cardiovascular disease. *Lancet*. 355 (9205): (2000: 675-687).
- JACOBSON, T. A.** Clinical context: current concepts of coronary heart disease management. *Am J med*: 110. Suppl: 6A:S-11. (2001). (Available at <http://www.ncbi.nlm.nih.gov/80/entrez/quicksearch.html?pubmed=11311191&dopt=Abstract>) 06/07/2001.
- KROMHOUT, D.** The global burden of coronary heart disease. In: anonymous. 1st Unilever Symposium Monograph Series (1999: 5).
- UN ACC/SCN.** Nutrition and poverty: papers from the ACC/SCN 24th session Symposium. Kathmandu. (1997: 1-103).
- MURRAY, C. J. L. and LOPEZ, A. D.** Alternative visions of the future: Projecting mortality and disability, 1990-2020. In: MURRAY, C. J. L. & LOPEZ, A. D. Eds. The global burden of disease. S. I. : Harvard School of public Health on behalf of WHO and the World Bank. (1996c: 325-395).
- WHO/AFRO.** Epidemiology. (2001). (Available at <http://www.whoafr.org/cdp/epidemiology.html>) 6/14/01.



- SHETTY, P. S.** Diet, life style and chronic diseases: lessons from contrasting worlds. In: Shetty, P. S. & McPherson, K. Diet, lifestyle and chronic diseases: lessons from contrasting worlds. Chichester: John Wiley and Sons. XV-XVI. (1997: 269-280).
- MURRAY, C. J. L. and LOPEZ, A. D.** Final results and their sensitivity to alternative epidemiological perspectives, discount rates, age-weights and disability weights. In: MURRAY, C. J. L. & LOPEZ, A. D. Eds. *The global burden of disease*. S. I: Harvard School of public Health on behalf of the WHO and the World Bank. (1996b: 261).
- USAID (United States of America International Development).** Micronutrients. Increasing survival, learning and economic productivity. Washington D. C: USAID. (1993: 28).
- ONIAN'G'O, R. and MUTUKU, J.** Eastern Africa: Food security, food safety and health. Unpublished paper. (n. d).
- UNICEF.** The State of the World's Children (1995). 68p.
- UNICEF.** Statistics-Africa. (2001). (Available at [http://www.unicef.org/status/Country\\_IPage180.html](http://www.unicef.org/status/Country_IPage180.html)). 8/7/01.
- OMNI.** Opportunities for Micronutrient Interventions. Micronutrient update: *Technical series*. (2001). (Available at <http://www.mostproject.org/Techfact1.htm>). 8/7/01.
- BACHOU, H.** Editorial. *South African Journal of clinical Nutrition*: 13 (3): (2000).
- KITANGE, H. M. , SWAI, A. B. M. , McCarty, D. G. , MASUKI, G. , MTINANGI, B. L. , KILIMA, P. M. and ALBERTI, K. G. M. M.** Risk factors of coronary diseases in Tanzanian Africans. In: Lukumanji, Z. & SWAI, A. B. M. (eds). Proceedings of the workshop on Diet Related Chronic Diseases 18-19 August 1992 Dar -Es- Salaam, Tanzania: Tanzania Food and Nutrition centre, and Muhimbili University College of Health sciences, Dar -Es -Salaam, (1993: 2-5).
- ANC/WHO & UNICEF.** A national health plan for South Africa. (1994: 8-9)
- MAY, J.** (ed). Poverty and Inequality in South Africa. Report prepared for the Office of the Executive Deputy President and the Inter-Ministerial committee for poverty and Inequality. Praxis publishing. Durban. 1998. (1998).
- NEW SCIENTIST.** Editorial; rallying point. " If we don't help South Africa deal with HIV we will live to regret it". 6 May. No. 2237. (2000).
- STATISTICS SOUTH AFRICA.** Mid year estimates. Statistical Release P0302. (Available at [http://www.statssa.gov.za/stastical\\_releases/stastical\\_releases.htm](http://www.statssa.gov.za/stastical_releases/stastical_releases.htm)). (1999).
- MAIL and GUARDIAN.** "AIDS campaigns still have a long way to go". 1st to 7th September. (2000: 10-11).
- DoH.** (Department of Health). Integrated nutrition programme. A foundation. (2001). (Available at <http://196.36.153.56/doh/programmes/nutrition.html>). 6/14/01.
- WALKER, B. R. , SODERBERG, S. , LINDAHL, B. & OLSSON, T.** Independent effects of obesity and cortisol in predicting cardiovascular risk factors in men and women. *Journal of internal medicine*. 247 (2): (2000: 198-204. ) Feb.
- VORSTER, H. H. , JERLING, J. C. , STEYN, K. , BADENHORST, SLAZUS, W. , VENTER, C. S. , JOOSTE, P. L. and BOURNE, L. T.** Plasma fibrinogen of black South Africans: the BRISK study. *Public health nutrition*, 1 (3): (1998: 169-176).
- KITTNER, S. J. , WHITE, L. R. , LOSONCZY, K. G. , WOLF, P. A. and HEBEL, J. R.** Black-white differences in stroke incidence in a national sample. *Journal of the American Medical Association*, 264: (1990: 1267-1270).
- VORSTER, H. H. , WISSING, M. P. , VENTER, H. S. , KRUGER, A. , MALAN, N. T. , DE RIDDER, J. H. , VELDMAN, F. J. , STEYN, H. S. , MARGETTS, B. M. and MACLNTYRE, U.** The impact of urbanisation on physical, physiological and mental health of Africans in the Northwest province of South Africa: the THUSA study. *South African Journal of Science*, 96: (2000: 505-514).
- BRADSHAW, D. , BOURNE, D. , SCHNEIDER, M. and SAYED, R.** Mortality patterns of chronic diseases of lifestyle in South Africa. In: Fourie, J. & Steyn, K. Eds. Chronic diseases of lifestyle in South Africa. MRC Technical Report. PAROW. Cape Town. MRC. (1995: 5-35).
- SEFTEL, H. C. , RAAL, F. J. and JOFFE, B. I.** Dyslipidaemia in South Africa. (In: Fourie, J. & Steyn, K. Eds. Chronic diseases of lifestyle in South Africa. Review research and identification of essential health priorities. MRC Technical Report. PAROW. Cape Town. MRC. (1995: 61-69).
- VORSTER, H. H. , CUMMINGS, J. H. and JERLING, J. C.** Diet and haemostatic processes. *Nutrition research reviews*, 10: (1997a: 115-135).
- PESTANA, J. A. X. , STEYN, K. , LEIMAN, A. and HARTZENBERG, G. M.** 1996. The direct and indirect cost of cardiovascular disease in South Africa in 1991. *South African Medical Journal*. 86: 679-784.
- OOSTHUIZEN, W.** The effect of nutrition on risk factors for coronary heart disease. Potchefstroom: Potchefstroom University for Christian Higher Education, Thesis-PhD. (1999).
- BRADSHAW, D and BUTHELEZI, G.** Health Status and Determinants. In: Harrison, D. , Barron, P. & Edwards, J. (Eds). *South African Health Review 1996*. Health Systems Trust. Durban, 1996. (1996).
- BRADSHAW, D. , MASITENG, K. and NANNAN, N.** Health Status and Determinants. In: Health Systems Trust Report. *South African Health Review*.
- DORRINGTON, R. E.** The Demographic Impact of HIV/AIDS in South Africa. Presentation to AIDS 2000 Conference. Durban. 2000. (2000).
- LABADARIOS, D.** National Food Consumption Survey in children aged 1-9 years. South Africa 1999. Draft report, April 2000. (2000).
- HARRISON, S. and QOSE, M.** Health legislation. In: Ntuli, A. (Ed). *South African Health Review 1998*. Health Systems Trust. Durban. 1998. (1998).
- SHUNG-KING, M. , GIESE, S. , HENDRICKS, M. , IRIAM, J. , ABRAHAM, E. , GUTHRIE, T. , HUSSEY, G. , JACOBS, M. , and PROUDLOCK, P.** Child health. In: Health Systems Trust Report. (2000: 365-391).
- VORSTER, H. H. , OOSTHUIZEN, W. , JERLING, J. C. , VELDMAN, F. J. and BURGER, H. M.** The nutritional status of South Africans. A review of the literature from 1975 – 1996. Durban Health Systems Trust. (1997b: 47).
- WHO.** Controlling the global obesity epidemic. (2000b). (Available at <http://www.who.int/nut/obs.htm>=Abstract). 6/14/01.
- World Bank.** Investing in Nutrition with World Bank assistance. In: Del Rosso, J. M. (ed). World Bank. Washington DC. (1992).
- UNICEF.** The State of the World's Children 1998. Oxford University Press. Oxford. (1997).
- UN ACC/SCN.** Nutrition and poverty: Papers from the ACC/SCN 24th Session Symposium, Kathmandu. (1995).