

Towards the Nassau Declaration

**Nutrition in Mental Health,
Non-Communicable Diseases
and HIV/AIDS**

***The Evidence and the
Challenge***

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for
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1. Summary

Health in the Caribbean has improved more over the last 50 years than anytime in our history. This is quite spectacular and hopefully, irreversible. With this change in the health profile chronic non-communicable diseases, obesity, HIV/AIDS and mental health have become the major health concerns of the region.

The role of food and nutrition in the achievement and maintenance of good health has been highly prioritized by the region's governments and policy makers. It is a key component of the Caribbean Cooperation in Health (CCH) Initiative launched by the CARICOM Ministers of Health and more recently by the Heads of Government in the Nassau Declaration.

In this paper we will show the direct, and sometimes indirect, link between nutrition and non-communicable diseases, HIV/AIDS and mental health.

In summary the links between nutrition and chronic non-communicable diseases are:

- The increasing incidence of obesity has had an important impact on the incidence of cardiovascular disease, type 2 diabetes mellitus and cancer among others.
- Obesity among preschool children is increasing at a very fast rate. The risk of adult obesity is much higher in these cases.
- Young adult obesity is associated with child obesity
- Caribbean has three and a half times more deaths from prostate cancer than the global average.
- Mortality rates from breast cancer are higher than in the USA or Canada.
- Mortality rate from cervical cancer is eight times higher than those reported in USA and Canada
- World Cancer Research Fund has established a possible link between consumption of saturated animal fats, meat and milk and dairy products and prostate and breast cancer.
- Low vegetable consumption has also been linked with prostate and cervical cancer

The links between HIV/AIDS and nutrition can be summarised as:

- Weight loss and wasting is experienced by at least 90% of people with AIDS.

- People with AIDS require 20% more energy due to systemic infection or fever.
- Many of clinical features of HIV infection cause nutritional problems and may be exacerbated by the presence of undernutrition
- HIV medication can affect nutritional intake
- Nutrition intervention with people living with HIV/AIDS show reduced morbidity, improved health outcomes and reduced hospital stays.
- Improved nutrition can delay progression of AIDS by improving immune systems and decrease opportunistic infections.

Many of the traditional mental health problems have been recently linked to nutritional problems either in their management, manifestation or initial triggering. Some of these are:

- Anxiousness, depression, schizophrenia, mania and other behaviours all have nutritional implications, which are usually manifested through overeating or under-eating.
- Nutrition has been well associated with psychological disorders of eating disorders of Bulimia and Anorexia.
- Neuromuscular, speech and hearing abnormalities are common among children of iodine deficient mothers.
- Good nutrition, both long term and current may protect cognitive functions as we age.
- Breast-feeding has also been positively linked to cognitive behaviour and studies have found that babies breast fed for more than two months developed higher IQ's than the general population.
- Cognitive development is delayed or stunted in undernourished children who may also show stunted physical growth.
- Obesity is associated with an increased risk of depression and slow cognitive abilities.
- Proper nutrition during recovery from substance abuse affects the rate and the quality of physical recovery.

The paper also postulates broad strategies to using nutrition in the prevention and control of these conditions. These strategies focus on:

1. Policies and programs
2. Human and Financial Resources.

These strategies will not only improve the quality of life of our people but will also contribute to the financial well-being of society at large.

We therefore ask that the Caucus of Ministers responsible for the Health of the Caribbean People endorse these recommendations and support the implementation of the strategies within the region.

2. Introduction

In July 2001 the Heads of Government of CARICOM meeting in the Bahamas issued the Nassau Declaration recognizing that “The Health of the Region is the Wealth of the Region”. This declaration also declared a commitment to implement CCH (Phase II) which has Food and Nutrition as one of its main components. In the Nassau declaration, the Heads of Government mandated that HIV/AIDS, Chronic Non-Communicable Diseases and Mental Health should be priority areas.

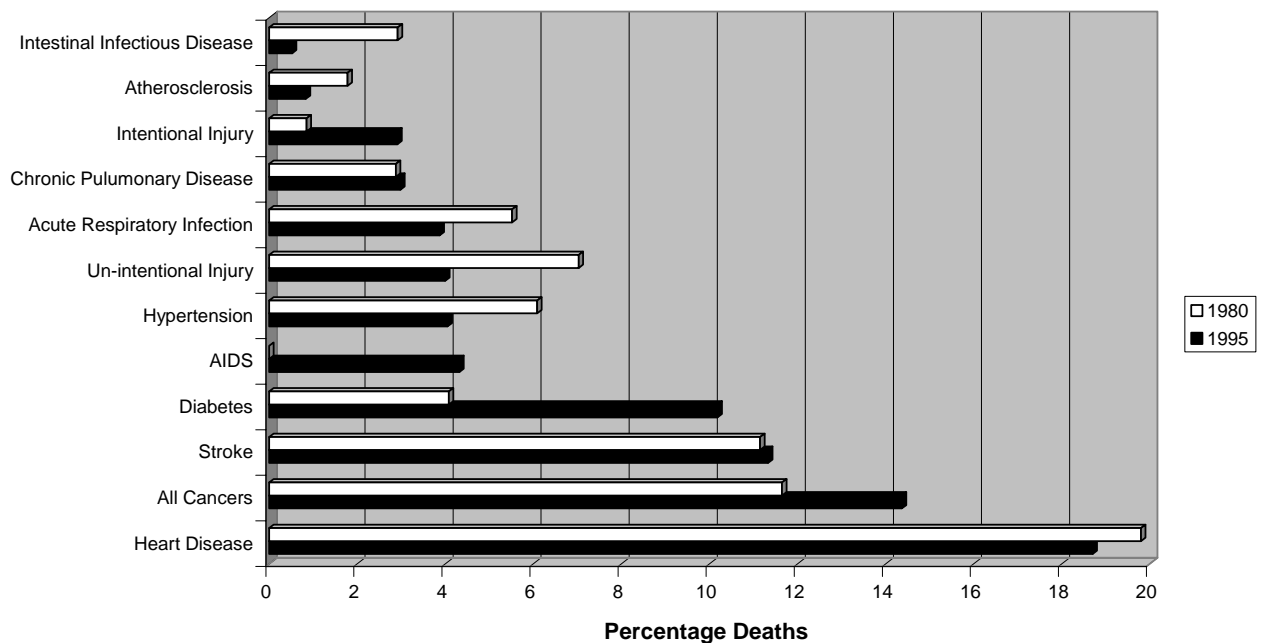
This paper seeks to highlight the importance of food and nutrition in each of these priority areas. It identifies the central role which food and nutrition play in the prevention, management and control of Chronic Non-communicable Diseases, HIV/AIDS and Mental Health. The paper concludes by highlighting the key challenges to policy matters for food and nutrition to substantially reduce the main causes of mortality and morbidity in the region.

3. NON-COMMUNICABLE DISEASE

3.1 Mortality & Morbidity

Non-communicable diseases have become a major public health problem in the region. This epidemiological transition has resulted in large part from changing population structures and a rapid transition to a sedentary lifestyle with diets high in fats, sugar, and salt. Heart disease, cancer, stroke, and diabetes accounted the majority of deaths between the period 1980-95 (figure 1)¹

Figure 1: Leading Causes of Death in the Caribbean *, 1980 and 1995



* Analysis limited to countries with data available for both years: The Bahamas, Barbados, Belize, Dominica, St. Kitts and Nevis, St. Lucia, Trinidad and Tobago, and Turks and Caicos Islands

Evidence is accumulating that the changes, which underlie the development of cardiovascular disease and diabetes, can be identified during early childhood. This pattern has also been found in Caribbean children. This means that the chronic diseases may manifest as clinical disorders during later life, but the programming is there from very early in life. These consequences of poor childhood nutrition stress the need to acquire adequate food and nutrition in early life and to protect the right to proper nutrition in childhood. Low birth weight, which in the region ranges from 9-12%, has also been shown to be associated with later cardiovascular disease, diabetes and hypertension².

The regional significance of chronic non-communicable diseases is reflected in prevalence rates. Hypertension, a major risk factor for heart disease, affects approximately 45% of adults aged 40 years and over⁴. Of great concern is the increasing prevalence of diabetes and the resultant effect on health care costs and individual well being and productivity. The English-speaking Caribbean has the highest mortality from this cause in all the sub-regions of the Americas. Diabetes-related deaths in 1994 had increased 147% over the 1980 level and represented the third leading cause of loss of years of potential life among women and tenth among men⁵. Prevalence figures of 13% and 17.9% in adults have been reported for Trinidad & Tobago and Jamaica respectively^{6, 7}. It is estimated that, in the next decade, diabetes prevalence will increase by 74% of current levels in Caribbean Islands⁵.

The increasing trend in obesity is considered to be a major contributory factor in chronic disease prevalence in the region. The rising obesity levels, particularly among women, are attributed to changes in traditional diets and the adoption of relatively more sedentary lifestyles. In some countries more than half of adult women and more than a quarter of males are reported to be obese. Data from Barbados highlights the importance of obesity as a risk factor in chronic diseases. Based on available evidence, obese persons, (BMI>30) of 40-79 years had a 2.6 times greater risk of hypertension than persons with BMI<25, and obese women had 5.2 times the risk of developing diabetes. It is estimated that reducing obesity in the Barbadian population could reduce hypertension and diabetes by 30% and 33% respectively.

3.2 Nutrition and Non-Communicable Diseases

Table 1: Chronic Diseases and Modifiable Risk Factors

RISK FACTORS	MAIN CAUSES OF DEATH IN THE CARIBBEAN				
	RANK = 1 Cardiovascular Disease	RANK = 2 Stroke	RANK = 3 Cancer	RANK = 4 Diabetes	RANK = 5 HIV/AIDS
Obesity (body weight)	+++	++	+++	+++	
Diet (lack of fruits/vegs)	+++	++	+++	++	+
Physical inactivity	+++	++	++	++	
High cholesterol	+++	+++	+	+	
Tobacco use	++	++	+++	?	
Alcohol use	?	?	+	+	+
Stress	?	?	?	?	++
Pollution			+		
Low SES	+	+	+	+	+
Sexual behavior			+		+++
Hypertension	++	+++			
Diabetes	++	++			
Undernutrition				+	++

Note: Established risk factors (strong = +++; moderate = ++; weak = +)
Possible risk factors = ?

As can be seen from Table 1, obesity has an important impact on the incidence of cardiovascular disease, type 2 diabetes mellitus, cancer and stroke. Obesity has a more pronounced impact on morbidity than mortality and because of this it has not yet become an important issue on the health care agenda. However, disability due to obesity-related cardiovascular diseases has already shown an increase in industrialized countries. Disability due to obesity-related type 2 diabetes is also increasing and may be one of the major causes of disability in the Caribbean with increasing disabling nephropathy, arteriosclerosis, neuropathy and retinopathy.

At the simplest level obesity is a result of energy intake exceeding energy expenditure over an extended period of time. Many different factors may contribute to this imbalance and include genetics, dietary and physical activity patterns, psychological factors and environmental and cultural factors.

A study done by Wilks et al, in 1991, showed that 25% of males and 69% of females, in Barbados, were either obese or overweight (BMI >25) whilst in Jamaica 30.7% of males and 64.7% of females fell into this classification⁸. A similar study by Wilks et al in St.Lucia⁸ showed a mean BMI for males at 24.3 and 27.3 for females. The Caribbean Food and Nutrition Institute (CFNI) has also conducted national studies in Guyana (2000) and Trinidad and Tobago (1999)⁹. These have shown that 40.3% of males and 57.6% of females, in Guyana, have a BMI higher than 25 and in Trinidad 40.5% of males and 53.7% of females would be classified in this group. The Dominica Food and Nutrition Council carried out a study in 1996 which showed a national rate of obesity and overweight of 47.9%. Surveillance data from the British Virgin Islands shows that 56.7% of the population is either obese or overweight⁹.

These data are alarming; it is also not a comprehensive picture of the region. It is imperative to have good surveillance systems working within the region if we are to evaluate the extent of the obesity problem and to eventually monitor any interventions for prevention and control. Once again it is important that obesity goes to the top of the list in the health agenda and also in the national agenda. Good surveillance systems are essential in combating all chronic diseases, such as diabetes, hypertension, cancer and obesity.

The global prevalence of overweight amongst preschool children is estimated at 3.3%. Within the Caribbean region there is one of the highest incidences for this age group with St. Lucia having 2.5% of the 0-5 yr.population, Barbados 3.9%, Trinidad & Tobago 3.0% and Jamaica 6.0%¹⁰. The risk of adult obesity is 2.0-2.6 times greater in obese pre-school children than in non-obese pre-school children¹¹. Young adult obesity is associated with child obesity (defined as >85 percentile) and this risk increases when the mother or father of the obese child was also obese.

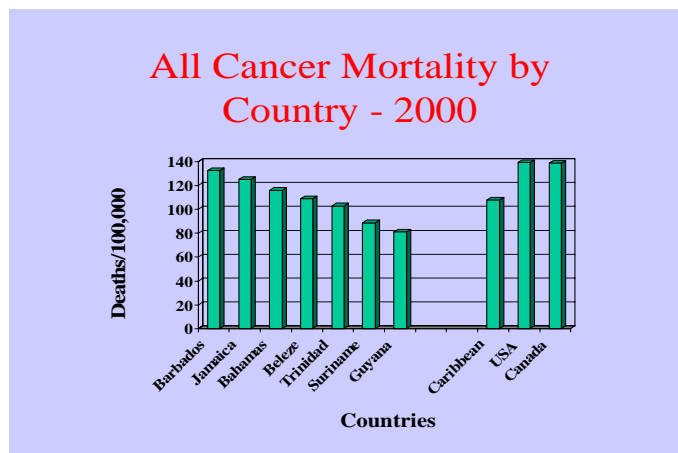
Studies carried out among overweight children aged 5-15, in the US¹², have shown that 61% already have one or more cardiovascular risk factors and 27% have two or more such factors. Moreover, type 2 diabetes mellitus, so rare in youth that it used to be known as Adult Onset Diabetes Mellitus, has risen dramatically in adolescents. Using this model the prospects for the Caribbean region are not very bright and rapid and immediate interventions are necessary.

The prevalence of overweight and obesity in children is evident in all the countries. Whilst in Guyana and Jamaica the rate of overweight and obese children is estimated at 4.3%, in Grenada the latest figures show that 1.0% of the 0-5 year olds are overweight or obese⁹. Data collected from Dominica and St.Kitts in 1999 show rates of 9.7% and 10.6% respectively, whilst in St.Vincent data from the nutrition unit in 1998 showed a rate of 7.2%⁹.

Data collected within the region show that the incidence of obesity is increasing exponentially and that this trend is especially affecting young children. The trends over the past ten years (1990-99) show a systematic increase in the rate of obese children. Data from Dominica shows an increase from 6.0% (1990) to 9.7% (1999). In St.Kitts the rate increased from 7.1% (1990) to 10.6% (1999) and in St.Vincent from 6.9% (1991) to 7.2% (1998)⁹.

Cancer (As An Example)

Cancer is also one of the leading causes of mortality in the Caribbean region. In 2000, within the region, it accounted to around 110 deaths per 100,000 population. When compared to the United States level of 140 deaths per 100,000 population this can be classified as a high mortality rate¹⁷.



Within specific types of cancers and within specific countries the rates vary and in some cases are far higher than those found in the USA and Canada¹⁸.

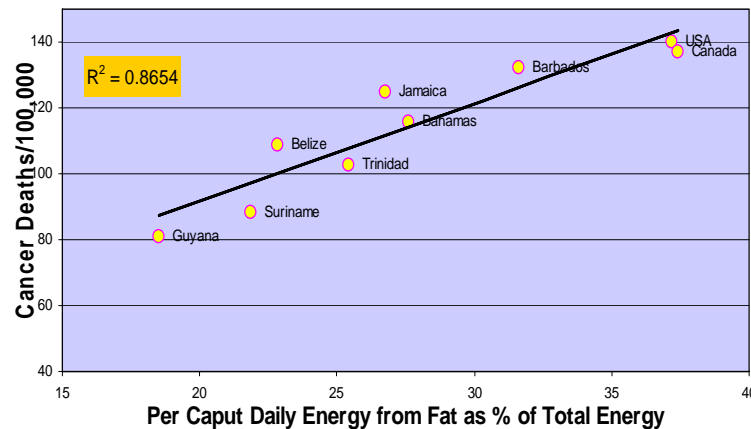
CANCER RATES RELATIVE TO USA

	PROSTATE	BREAST	CERVIX
Location	<u>Rank 1</u>	<u>Rank 2</u>	<u>Rank 3</u>
World	44	59	244
Caribbean	158	84	500
United States	100	100	100

There are various known risks associated with cancers, most of which are preventable. These include alcohol consumption, smoking, diet and lack of physical activity.

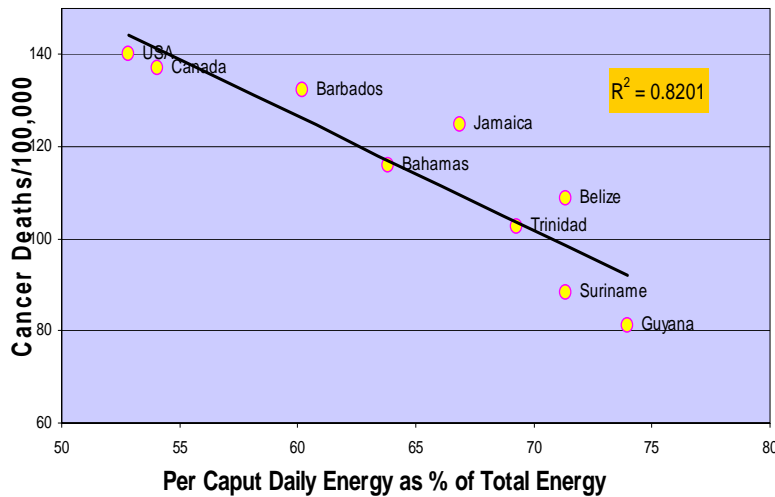
The World Cancer research fund has established a possible link between consumption of saturated animal fats, meat and milk and dairy products and prostate and breast cancer¹⁹. They have identified these dietary habits as providing an increased risk for these two types of cancers.

FATS & ALL CANCERS



Vegetable consumption has also been linked with prostate and cervical cancer as increased consumption decreases the risk of both these types of cancer.

PLANT FOODS AND ALL CANCERS



Increased physical activity and the consumption of fruits and vegetables have been shown to have a positive effect on the risk of breast, stomach, colorectal and lung cancer. The consumption of alcohol is also directly linked to the incidence rates and heavy drinkers have a three fold higher risk of oesophageal cancer when compared to non-drinkers¹⁷. The rate falls to twice for mouth, larynx and pharynx and one and a half times for liver and breast cancers.

An important consideration in all this is the cost of treatment for cancers. The cost of treatment in developing countries is six times higher than that in developed countries. When one considers that the GNP per capita of developed countries is twenty fold higher than that of developing countries the cost is even more exorbitant. On average the treatment per cancer case in the developed countries is 0.46% of the GNP whilst in the developing countries this is almost 43%¹⁷. This is another reason why prevention is important and that primary prevention interventions are implemented without delay.

3.3 Causative Factors

The increased incidence of chronic non-communicable diseases in the Caribbean has been attributed to aspects of development in the region, which have led to changes in the dietary pattern and the decrease in physical activity (see Table 1). Improvement in food availability has been associated with an increased supply of foods from animals, fats, oils and sugar. The resulting increase in the intake of these foods and the decline in the consumption of cereals, fruits, vegetables, legumes and ground provisions are contributory factors to the growing problem of obesity. With modernisation in the region there has also been a proliferation of fast food restaurants, with the major offering being fatty foods and refined carbohydrates. Additionally, as the region

developed there was increased mechanisation and decreased manual labour, improvement in transportation and a decline in physical exercise.

3.4 Current Efforts

Various institutions and governments of the region have been working on the problem of chronic non-communicable diseases. The main thrusts until recent years were aimed at the medical treatment of the problem. However in recent years the benefits of prevention have taken over and the main thrust now is on the prevention of non-communicable diseases. It is here that nutrition and lifestyle are important contributors. The International organisations in the region such as PAHO/WHO have contributed to various projects and interventions which have increased the awareness of the public to the importance of nutrition in the prevention of NCD's. The Caribbean Food and Nutrition Institute (CFNI) has been contributing by organising training programs for health care professionals on the prevention of obesity and NCD's. As lifestyle modification is a very difficult task, CFNI has also approached prevention from a different angle that is the institution of healthy lifestyle behaviours from birth. To achieve this CFNI has trained caregivers in the field of infant feeding as well as developed Guidelines on Young Child Feeding in the Caribbean.

Behavioural modification is the key to success in prevention of NCD's and programs have been instituted in the region, with the help of PAHO/WHO. Most of these programs are aimed at school children; however others have been instituted in workplaces as well as aimed at the general public.

Another area developed is the adoption of National Nutrition Policies and Plans. Most countries in the region have either developed or are in the process of developing these plans. These will help coordinate the multifactorial and multisectoral parameters that are needed to fight against the epidemic of obesity. Another important development is the adoption of National Dietary Guidelines. This follows the work started by CFNI and FAO in developing Regional food-based guidelines which is another vital instrument in the education strategies used to help people modify their eating habits and lifestyle.

The University of the West Indies, PAHO/WHO, CFNI, TMRI and others have all been working in the field of research in obesity. In the last few years more efforts have been concentrated on behavioural studies. This research will help policy makers and those in the field channel their resources effectively and efficiently.

3.5 Future Needs

The region needs more investment in the field of Behavioural Modification. We now need to move from the stage of awareness to the stage of action. Most Caribbean countries already have a good awareness program, through the Ministries of Health. However, an action program is a multi-disciplinary, multi-

faceted strategy which needs to be developed not only by the Ministry of Health but needs the support of various other Ministries in Government.

To tackle the problem of obesity and non-communicable diseases we need to develop both collective individual as well as institutional strategies which the general public can implement and which are long-lasting. These strategies need to be aimed at:

1. Building healthy public policies
2. Creating supportive environments (including the media)
3. Reorienting health services
4. Strengthening community action
5. Developing personal health skills
6. Research.

To change behaviour the effort must be shared by all those involved, be it the Ministries of Health, Agriculture, Education, Trade etc. The paradigms put forward by The Caribbean Charter on Health Promotion should be used to fuel all the strategies proposed above.

4. NUTRITION AND HIV/AIDS

4.1 Mortality & Morbidity

In the Caribbean, HIV/AIDS is an epidemic, with the highest incidence of reported AIDS cases in the Americas and the second highest rate worldwide. In addition, UNAIDS has reported that there are about 360,000 orphans.

In the Americas, 9 of the 12 countries with the highest prevalence are located in the Caribbean Sub-Region. In addition, AIDS is the leading cause of death among 15-45 year olds regardless of gender and overall 2% of adults between ages 15-49 are living with AIDS²⁰.

HIV/AIDS has a dramatic impact on human life as well as on the social and economic resources. It is reported that up to 25% of beds in medical wards are occupied by HIV/AIDS patients. Moreover, the most affected age group is the productive period of life for adults. This manifests itself in a financial burden that is felt in all sectors, for example health, services, economic, tourism as well as households.

The effect of HIV/AIDS on the Gross Domestic Product of Trinidad and Tobago is projected, in a low case scenario, to have a negative impact of over 4%, whilst in Jamaica this is estimated at over 6% (CAREC/UWI). In the same two countries the HIV/AIDS Expenditure is being projected at an additional 25.3% and 35.4% respectively.

The rate of mother to child transmission (MTCT) incidence in the region in 1996 ranged from 0% in the British Virgin Island and Cayman to 7.1% in Guyana²⁰. The risk of MTCT through breast feeding ranges from 4-14% depending on location and whether breastfeeding was sustained over one year^{21, 22}. In the Caribbean, women need to be more informed about MTCT. Health workers are not fully aware of the methods of MTCT and may not be counseling pregnant women on this issue. The challenge for the post-partum period is to reduce infants' risks of contracting HIV among women who know their HIV status as well as those who do not. Several studies in Europe show that breastfeeding influences transmission^{23,24,25,26} and adopt policies from there. In contrast, studies of exclusively breastfeeding populations^{27, 28,29,30,31} report much lower transmission rates.

Nutrition is perhaps the most neglected aspect of HIV/AIDS management and care in the Caribbean region. It is therefore useful to review the inter-relationship between nutrition and HIV/AIDS.

4.2 Effects of HIV/AIDS on Nutrition

Weight loss and wasting are the primary nutritional disorders of HIV infection. At least 90% of people with AIDS experience some form of weight loss and it is common for people to lose more than 20% of their usual body weight. People with AIDS require approximately 20% more energy and this may be higher if systemic infection or fevers are present. Many of the clinical features of HIV infection cause nutritional problems and may also be exacerbated by the presence of undernutrition. These interactions are usually complex and multifactorial.

HIV symptoms and their medication can have a devastating effect on nutritional intake. The physical causes of reduced food intake include esophageal candidiasis, dental decay and ulcers, which may occur in the mouth, esophagus or colon. All these make it difficult for people to swallow, painful to chew and may change the way food tastes. Medications may cause cramping and bloating, further reducing the desire to eat. Appetite is also suppressed by depression from HIV/AIDS, which in severe cases could cause nausea and vomiting. Social factors also combine to worsen inadequate food intake. HIV patients who lack access to a kitchen, food preparation skills or nutrition education may end up buying fast foods that are low in nutritional value.

AIDS illnesses therefore include inadequate food intake^{32, 33, 34}, altered metabolism^{35, 36, 37} and malabsorption^{38, 39} - all of which have nutritional consequences⁴⁰. Malnutrition is common in hospitalized AIDS patients and can result in immune system dysfunction, thereby increasing the risk of infection.

4.3 Effects of Nutrition on HIV/AIDS

Despite these effects of HIV on nutrition, it should be noted that even AIDS patients in hospital can consume up to 70% of basal energy needs and 65% of protein needs. Importantly, the amount of food intake increases for less ill patients (out of hospital) especially when the diets are well planned creative and well chosen. Nutritional support can therefore improve the nutritional status of "People Living With HIV/AIDS" (PLWHA), as it is a function of intake, absorption and metabolism. Disturbance of any of these can result in wasting. Malnutrition may be a factor in the development of opportunistic diseases and in the progression of the disease process.

Health care professionals who provide nutrition intervention and support to individuals infected with the HIV therefore have a challenging and difficult task. Nevertheless, aggressive nutrition intervention is indicated at all stages of HIV infection⁴¹.

The benefits of nutrition interventions to PLWHAs are substantial^{42, 43, and 44,45,46,47}. Nutrition Therapy saves lives, reduces morbidity, improves health outcomes, reduces cost and shortens hospital stays.

A diet rich in protein, energy and micronutrients contributes to resistance to opportunistic infections in AIDS patients⁴⁸. Good nutrition can provide a range of other benefits to HIV/AIDS patients: weight maintenance; psychological well being; improved self-esteem; increased efficiency of HIV medication and optimized immune function. Improved nutrition can also delay the progression of AIDS^{49, 50}. Furthermore appropriate nutrition interventions can improve an individual's strength, endurance, ability to tolerate and respond to therapy. Nutrition decreases the risk of developing opportunistic infections and PLWHA have a better quality of life. While affordable AIDS drugs might be within reach, it is critical that the nutritional state of PLWHA is such to maximize the benefits of these drugs. Every effort should therefore be made to ensure that the diet of PLWHA is as nutritious as possible.

Nutrition intervention is necessary at all stages of HIV infection. During the asymptomatic period, the goal of nutrition counseling is to promote an adequate, balanced diet for weight maintenance and prevention of vitamin and mineral deficiencies. In the later stages of the disease various supplemental regimes are recommended. In short, nutrition intervention and education should be a component of the total health care provided to individuals with HIV.

Improving the nutritional status of PLWHA can be beneficial in maintaining crucial body protein stores (body cell mass) and reducing the extent of weight loss, plus the psychosocial and economic impact of the disease. Nutrition education, appropriate dietary information and adequate training will equip healthcare workers and caregivers with a low-cost option in relation to other components of HIV/AIDS care.

4.4 Current Efforts

In an attempt to arrest the growing problem of HIV/AIDS various organizations, International, Regional and Local, have been devoting a significant amount of resources in prevention and treatment. The Caribbean Task Force on HIV/AIDS recognized that there is no meaningful response to this epidemic if the health care and medical treatment of those affected by the disease is not seen as a core element of their response. Without immediate action this epidemic will unleash untold harm in the Caribbean for decades ahead. This was reiterated in the Heads of Government declaration in Nassau, Bahamas where they identified the problem of HIV/AIDS as one of the three priority areas for economic development of the nations.

The Caribbean Food and Nutrition Institute (CFNI) with the assistance of the Canadian Government (CIDA) have embarked on a project to develop manuals on the importance of Nutrition in HIV/AIDS, for use by health care workers and people living with HIV/AIDS. These regional documents will be widely disseminated and also form the bases of a three year training project targeted at

care givers and persons living with HIV/AIDS on the importance of Nutrition in the treatment of the condition.

4.5 Future Needs

It is lamentable that in the Caribbean no major research has been conducted in relation to HIV transmission and breastfeeding, artificial feeding or on alternative/replacement feeding methods. Clearly this is an urgent need.

Further work also needs to be carried out at a community level on the importance of nutrition in HIV/AIDS. More work needs to be targeted at schools, the media and those directly in contact with PLWHA. This is a cost-effective way of preventing complications, hopefully retarding the progression and definitely improving the quality of life of those infected with the HIV virus.

5. MENTAL HEALTH

The relationship between nutrition and mental health may not be immediately evident. However, for virtually every major mental illness; empirical studies show that there are significant nutritional influences.

5.1 Nutrition in Depression & Schizophrenia

It has been widely recognised that chronic diseases such as obesity, non-communicable disease, cancer and HIV/AIDS can lead to depression and undue stress. Anxiousness, depression, schizophrenia, mania and other behaviours all have nutritional implications, which are usually manifested through overeating or under-eating. Magnesium levels in the blood of schizophrenic and depressed patients were shown to be lower than normal. These levels increased when the patients achieved clinical remission. It is hypothesized that the high stress level in severely ill psychiatric patients can sometimes lead to magnesium deficiency, which in turn could exacerbate symptoms such as anxiety, fear, hallucinations, weakness and physical complaints⁵¹. Selenium has also been shown to elevate mood and in particular to decrease anxiety and these effects were more pronounced in those who have lower levels of selenium in their diets to begin with⁵². Folate deficiency is common in psychiatric disorders, particularly depression⁵⁴. It is suggested that biochemically interrelated vitamins such as B₁₂ and folate may exert both a separate and combined influence on mental state, and that poorer vitamin status may contribute to some psychiatric disorders in the elderly⁵⁵. Recent studies have also suggested that there may be a link between schizophrenia and coeliac disease. Schizophrenia appears to be less common in societies who consume few cereal foods. It has been suggested that grain glutes may evoke schizophrenia in those with the appropriate genotype for the disease.

5.2 Nutrition in Eating Disorders

Nutrition has been well associated with psychological disorders of body image as manifested in the eating disorders of Bulimia and Anorexia. There is evidence that zinc deficiency may be one of the causes for anorexia nervosa and bulimia nervosa⁵⁶. This is due to a variety of reasons namely lower dietary intake of zinc, impaired absorption, vomiting, diarrhoea and bingeing on low-zinc foods. Zinc deficiency results in decreased food intake and this could exacerbate the altered eating behaviour in bulimics and anorexics^{56, 66}. Vitamin B₁₂ deficiency has been shown to be associated with obsessive compulsive disorders⁵³.

5.3 Nutrition in Cognitive Development

Vitamin B₆ and magnesium deficiencies have been associated with autism and have been effectively used in the treatment of autistic children⁵⁷. Iodine deficiency can reduce intelligence levels and is especially devastating for

pregnant women and their children, causing miscarriage, stillbirth or neonatal death. Neuromuscular, speech and hearing abnormalities are common among children of iodine deficient mothers⁵⁸. Lack of cobalamin (B₁₂) may lead to severe neurological disorders in strict vegetarians, especially in infants and toddlers. There is evidence that B₁₂ deficiency may contribute in delaying psychomotor development and retarded growth in macrobiotic children⁵⁹.

As expected, cognitive performance is related to nutritional status. Good nutrition, both long term and current may protect cognitive functions as we age. In recent studies the amino acid homocysteine was linked to decreased cognitive function. People with high levels of homocysteine and low levels of folate have a significantly poorer ability to recall words and details of a brief story. To keep homocysteine levels low it is recommended to eat more foods high in B vitamins^{60, 61}.

Eating breakfast regularly has been reported to improve performance and lead to a more positive mood, better memory and feelings of calmness. The high blood glucose after eating breakfast is one of the key reasons for the improvement in mental performance. Omitting breakfast and dinner negatively affects cognitive functioning^{62, 63, 64}.

Breast-feeding has also been positively linked to cognitive behaviour and studies have found that babies breast fed for more than two months developed higher IQ's than the general population, with the maximum impact seen among those breast-fed for at least seven months⁶⁵. These findings show a strong link between breast-feeding and intelligence. Researchers in the US and Denmark believe the nutrients in breast milk and the close physical contact with the mother are responsible.

Generally, the evidence from research over the past twenty years suggests positive effects for cognitive development through supplementation with folic acid, breast-feeding, supplementation with zinc and iron in malnourished and needy children and counseling to parents and schoolchildren on healthy diets. Cognitive development is delayed or stunted in undernourished children who may also show stunted physical growth. Similar problems appear to arise through iron-deficiency anaemia⁶⁷.

Fetuses that suffer from growth retardation have higher perinatal morbidity and mortality and are more likely to experience poor cognitive development and neurologic impairment during childhood. Research shows that as adults, intrauterine growth retardation babies have increased risk of cardiovascular disease, high blood pressure, diabetes and related diseases². There have also been proven correlations between nutrition and certain physio-psychological disorders resulting from certain inborn errors of metabolism such as phenylketouria and Prader-Willi Syndrome.

Research also suggests that carrying around a lot of excess weight may have a damaging effect on most facets of life, including memory⁶⁸. Overweight and obese people have slower cognitive abilities in comparison to people of a healthy weight. Obesity is also associated with an increased risk of depression in women⁶⁹. There is a complex relationship between depression, body image, weight gain and diet. However, the data consistently shows that maintenance of adequate physical activity and a nutritious but energy-appropriate diet are the keys to maximising physical health and psychological wellbeing⁶⁹.

Loss of memory and intellectual functions can have a devastating effect on persons everyday lives. Efforts to preserve cognitive ability into old age are therefore worthwhile. Results of intensive research indicate that sub-clinical deficiencies of essential nutrients and nutrient related disorders such as hypertension, hyperlipidaemia and diabetes could increase the risk of dementia⁷². Even moderate malnutrition may increase the risk of dementia and Alzheimers disease in susceptible people⁷³. Deficiency of vitamin B12 has been implicated to play a role in the pathogenesis of cognitive impairment in elderly people^{74, 75}. A diet containing high levels of antioxidants may prevent or retard cognitive deterioration^{74, 76, 77}.

5.4 Nutrition in Substance Abuse

Proper nutrition during recovery from substance abuse affects the rate and the quality of physical recovery. It enables the person to function at a higher level socially, mentally and cognitively during the period of treatment. Nutritional rehabilitation is the immediate need of the person recovering from substance abuse. This sets the foundation for the mental, emotional and physical progress of the recovery⁷⁸.

The role of nutrition in the management plans of persons with mental illnesses is also very important, not only to prevent secondary complications which can arise from certain therapies but also to ensure that the treatment being given is effective at its utmost potential. Most of the drugs used in the treatment of mental diseases have strong drug-nutrient interactions and unless appropriate nutrition is implemented the full potential of the treatment is not achieved⁷⁹.

5.5 Current Efforts

Work in the region has mainly been focused on infant weight and cognitive ability with research being done by the University of the West Indies and TMRI. However as the link between nutrition and mental health is only coming to light in recent years not much has been done in the region to capitalize on these findings. As more links are established between nutrition and mental health the region should take the opportunity to integrate these findings in the development of mental health programs.

5.6 Future Needs

The link between nutrition, physical activity, lifestyle factors and psychological well being should be assimilated into any preventative or treatment regimen. The focus should be on healthy eating, promotion of physical activity, maintaining a healthy body weight and improving general mental wellbeing. As the region Mental Health programs are being developed these factors should all be integrated in a holistic fashion. Once again these programs will need to be multi-sectoral and multifaceted.

In the meantime we must also look at the link between birth-weight and cognitive ability and focus our attention on pregnant females with particular emphasis on the problem of anaemia in pregnancy. Other focuses should be on the importance of breastfeeding and appropriate complimentary feeding practices.

6. Challenges for Nutrition in combating NCD's, Mental Health and HIV/AIDS

The previous section shows the critical and undisputable role of nutrition in the prevention and control of NCD's, HIV/AIDS and Mental health. This section highlights the challenges to the Caribbean if Nutrition is to impact on the burden of these diseases. There are two broad challenges that must be tackled:

1. Appropriate Policies
2. Resources – both human and financial.

6.1 Policies and programs

There are various challenges that face policy makers in the field of NCD's, Mental Health and HIV/AIDS; however in relation to nutrition the policies and programs should be aimed at four main approaches:

1. Individual Behavior Change – through action programs aimed at the schools, workplaces and the community at large. These programs should be linked to policies which promote and facilitate healthy behavioral attitudes.
2. Socio-environmental Support – through the development and adoption of National Nutrition Policies and the enactment of the plans that arise from such policies. Also through the development and implementation of Food-Based Dietary guidelines which can help citizens adopt a healthy lifestyle. These policies should be reinforced by programs of action which help facilitate healthy behavior from citizens
3. Effective Treatment – through the increased access to treatment for obesity management. This can be achieved by increased training programs for health care professionals in the field of prevention and by taking these programs to the community level.
4. Applied/Operational Research – through increased information to key stakeholders more informed decisions can be taken.

6.2 Human Resources

It is indisputable that nutrition is the cornerstone for the prevention and treatment of most known non-communicable diseases, HIV/AIDS and many aspects of mental health. It is one of the few lifestyle behavioural factors that can be modified and impacts positively on the prevention and treatment of these conditions. This is an important consideration since these diseases have now surpassed diseases of undernutrition and communicable diseases as the major causes of mortality and morbidity in our region. The main contributor to this

increase is the epidemic proportion by which obesity has increased in the region. Within the past twenty years the rate of obesity has increased exponentially and this has been mirrored by a similar increase in the rates of diabetes, hypertension and other cardiovascular diseases.

Nutrition and physical activity are the two most important elements in the management of obesity. This in turn is an essential part in the management of non-communicable diseases. Thus managing obesity through lifestyle modification vis-à-vis nutrition and physical activity should achieve a paralleled reduction in the incidence and complications from non-communicable diseases. This modification is not a quick or easy process and needs to be directed by professionally trained personnel.

The right persons for this job are Nutritionists and the functions of a Public Health Nutritionist and Dietitian need professionally trained persons, something, which is in severe shortage within the region. A study carried out by the Caribbean Food and Nutrition Institute in 2000 showed that there is an acute shortage of professionally trained public health nutritionists (see table). The study, which catalogued all those persons working in the “food sector” of the Ministries of Health, not only showed that the ratio of nutritionists to population is poor but also highlighted the fact that the number of posts designated, within the health system, for public health nutritionists was far from optimal.

Country	Dietitians & Nutrition Positions (1999)		Population ('000) 1998	Human Resources per 10,000 population	
	Posts	Filled		Post	Filled
Anguilla	1	1	8	1.25	1.25
Antigua	4	4	67	0.59	0.59
Bahamas	35	18	293	1.19	0.61
Barbados	15	12	263	0.57	0.46
Belize	6	6	230	0.26	0.26
Cayman Islands	3	3	34	0.80	0.80
Grenada	9	7	93	0.97	0.75
Guyana	20	17	856	0.23	0.20
Jamaica	87	80	2539	0.34	0.32
St.Lucia	10	9	148	0.67	0.61
St.Vincent	8	8	115	0.69	0.69
St.Kitts	5	2	41	1.21	0.49
Trinidad & Tobago	30	24	1318	0.23	0.18
ALL COUNTRIES	233	191	6005	0.38	0.32

Table: Number of Public Health Nutritionists & Dietitians working in the Public Health Service by Country

As can be seen from the table, which includes all public health personnel working in nutrition and dietetics, there is not only a shortage of posts but also that when these posts are established the vacancies are not always filled. This situation is further compounded, as the numbers indicated in the study did not make any distinction between those professionally trained and those who had no tertiary level training (such as diet technicians). Many Ministries of Health within the region do not have a sufficient number of professionally trained Public Health Nutritionists and many of our hospitals and health clinics do not have sufficient professionally trained dietitians.

Within the region there is currently only one institution that provides a bachelors course specifically in nutrition and dietetics. This is the University of Technology in Jamaica, which started a course in 2001 and currently has 13 students following an undergraduate course in nutrition and dietetics. Other courses offered by the University of Technology and the Northern Caribbean University are at diploma level. The University of the West Indies (St. Augustine) offers a bachelor's course in Human Nutrition and Ecology and UWI (MONA) offers an MPH course which has a substantial nutrition component, but does not provide specific training in public health nutrition. TMRI also runs courses leading to a Masters, M.Phil and PhD level in Nutrition. These efforts are not integrated or synergistic, and importantly not enough to cope with the human resource requirements of the region. There is a clear and urgent need to develop a holistic strategy for training in the field of nutrition for the various levels of service.

6.3 Financial Resources

The resources currently available in the Region would not support all the plans proposed above. However, through joint proposals by CFNI and specific Countries or CARICOM, funding should be sought from International or National Agencies external to the region.

Governments should also be considering the nutritional aspect of prevention and care when discussing proposals and loan bids from International agencies.

The development of National or Regional "Health Funds" should also be promoted as a way of financing these activities.

Although it might seem a huge financial burden initially, many developed countries have now realized that prevention is the only cost effective way of reducing the cost of disease. Nutrition is a key element in all these prevention campaigns and changes in the behavior of our populations will lead to a decrease in the mortality and morbidity from NCD's, mental disorders and HIV/AIDS. Thus investment in policies and programs which promote nutrition and the changes in lifestyle which lead to decreased obesity and increased healthy living will lead to cost savings both for the health budget as well as for Society at large.

7. CONCLUSION

The relationship between nutrition and non-communicable chronic diseases, HIV/AIDS and mental health are clearly defined. The role of nutrition in primary and secondary prevention has been identified and has been shown to be effective and efficient.

Nutrition interventions both at the primary and secondary level of prevention can not only decrease the extent of human suffering through an improved quality of life but also be beneficial to the greater community as the social cost and burden of disease is minimized. This will in turn have a positive effect on the economic viability of these disease conditions and can lead governments to lessen the economic burden of disease as well as focus budgets on sectors and technologies, which as yet have been prohibitive for the region.

We therefore ask that the Caucus of Ministers responsible for the Health of the Caribbean people, endorse the recommendations and support the implementation of these strategies within the region.

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