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The emergence of HIV/AIDS has exacerbated the hunger that was previously caused by droughts, famines and wars as it affects the economically active who are breadwinners in their households. The HIV/AIDS pandemic and increasing poverty have worsened the

food crisis that has not yet been resolved (Mauder & Wiggins, 2007). Several studies have been conducted on the association between poverty and HIV. Mixed evidence was obtained by various authors as the risky behaviour is high in both developed (partner change due to personal autonomy) and developing countries through low condom usage (Gillespie et al., 2007). It was found that material poverty increases the risk of contracting HIV through risky behaviour. In developing countries, it was reported that transactional sex was one of the modes of raising an income (Gillespie et al., 2007). According to the UN Assembly resolution (2006), "all people at all times, will have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life, as part of a comprehensive response to HIV and AIDS. HIV infection affects the general health of a person and her/his ability to perform daily activities of living, including the ability to generate income, and ultimately the overall quality of life. Of great concern is the nature, extent and magnitude of the impact of HIV/AIDS on agriculture and food security systems in Sub-Saharan Africa. HIV and AIDS and its impact on food security has been a thorny issue among policy makers. A study that was commissioned by the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) in seven countries in Southern Africa revealed that though good policies aimed at fighting HIV and poverty are in place in some countries, the sting of the pandemic continues to be experienced with more persons becoming infected and continuing to die of AIDS-related diseases. AIDS affects agricultural production and subsequently household food security. HIV-infected persons are severely constrained in generating an income or to produce food for their households.

The impact of HIV/AIDS on food security and nutrition in South Africa

**THE IMPACT OF HIV/AIDS ON FOOD SECURITY
AND NUTRITION IN SOUTH AFRICA**

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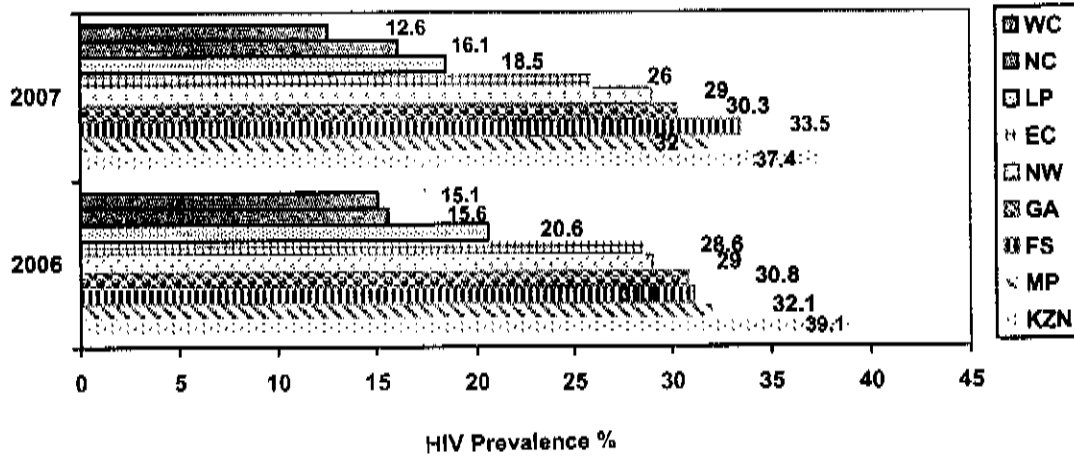
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1. Introduction

The Human Immunodeficiency Virus /Acquired Immune Disease Syndrome (HIV and AIDS) pandemic is one of the biggest crises South Africa, Africa and the rest of the world are facing today. Primary infection with HIV is the underlying cause of AIDS. An estimated 33.2 million people worldwide were living with HIV/AIDS in 2007 (UNAIDS, WHO, 2007), and millions of lives have been lost through this pandemic. Sub-Saharan Africa, carries the highest number of HIV infected persons (about 70%), yet it accounts for 11% of the world population. South Africa is reported to have the highest number of HIV-infected persons in the world, with about 5.5 million people living with HIV (UNAIDS, WHO, 2007). Persons aged 15-24 years old account to 90% of new infections (UNAIDS, WHO, 2007). In South Africa, KwaZulu-Natal province has the highest prevalence of HIV/AIDS, followed by Mpumalanga (Fig. 1)(Department of Health, 2007 Report).

The emergence of HIV/AIDS has exacerbated the hunger that was previously caused by droughts, famines and wars as it affects the economically active who are breadwinners in their households. The HIV/AIDS pandemic and increasing poverty have worsened the food crisis that has not yet been resolved (Maunder & Wiggins, 2007). Several studies have been conducted on the association between poverty and HIV. Mixed evidence was obtained by various authors as the risky behaviour is high in both developed (partner change due to personal autonomy) and developing countries through low condom usage (Gillespie et al., 2007). It was found that material poverty increases the risk of contracting HIV through risky behaviour. In developing countries, it was reported that transactional sex was one of the modes of raising an income (Gillespie et al., 2007). According to the UN Assembly resolution (2006), "all people at all times, will have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life, as part of a comprehensive response to HIV and AIDS. HIV infection affects the general health of a person and her/his ability to perform daily activities of living, including the ability to generate income, and ultimately the overall quality of life. Of great concern is the nature, extent and magnitude of the impact of HIV/AIDS on agriculture and food security systems in Sub-Saharan Africa. HIV and AIDS and its impact on food security has been a thorny issue among policy makers. A study that was commissioned by the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) in seven countries in Southern Africa revealed that though good policies aimed at fighting HIV and poverty are in place in some countries, the sting of the pandemic continues to be experienced with more persons becoming infected and continuing to die of AIDS-related diseases. AIDS affects agricultural production and subsequently household food security. HIV-infected persons are severely constrained in generating an income or to produce food for their households.

Figure 1. Provincial HIV prevalence - antenatal attendees



Source: Department of Health, 2007

2. Food security

Food security refers to access (both physical and economic) by all people at all times to adequate, safe and nutritious food for an active healthy life (FAO Rome WFP, 1996). According to the UN Assembly resolution (2006), “all people at all times, will have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life, as part of a comprehensive response to HIV/AIDS”. This resolution acknowledges the existence of hunger that is being exacerbated by HIV/AIDS. South Africa as a country boasts of food security at national level. However, food insecurity exists at household level. According the National Food Consumption Survey (NFCS 2005), 20% of children aged 1 to 9 years were stunted. Children between ages 1 to 3 years consumed less than half of recommended energy levels required for optimal growth. A study conducted by Rose and Charlton (2002) reported household food insecurity in 43% of households in South Africa and it is also suggested that more than 14 million South Africans (35% of the population) are estimated to be vulnerable to food insecurity (HSRC, 2004). The HSRC (2004) report stated that all dimensions of food security – availability, stability, access and use of food are affected where the prevalence of HIV is high.

According to Wiesmann (2006), food security and nutrition are an outcome of national incomes, as household food security requires goods and services to be produced by the national economy. AIDS affects agricultural production and subsequently household food security (Wiesmann, 2006). HIV-infected persons are limited in generating an income or to produce food for their households. Therefore a synergistic relationship exists between HIV infection and food security.

3. HIV and AIDS and food security

HIV infection affects the general health of a person and her/his ability to perform daily activities of living, including the ability to generate income, and ultimately the overall quality of life. Of great concern is the nature, extent and magnitude of the impact of HIV/AIDS on agriculture and food security systems in Sub-Saharan Africa (Sibanda et al., 2007). HIV/AIDS and its impact on food security has been a thorny issue among policy makers in South and Southern Africa, if not world

wide. A study that was commissioned by the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) in seven countries in Southern Africa (Sibanda et al., 2007) revealed that though good policies aimed at fighting HIV and poverty are in place in some countries, the sting of the pandemic continues to be experienced with more persons becoming infected and continuing to die of AIDS-related diseases. The pandemic also prohibits economic development as traditional food production methods demand heavy manual labour, which is reduced when people are afflicted with HIV/AIDS. As farm workers are also infected, it would be anticipated that the general population will be affected as a result of the declining workforce and consequent low agricultural production (Sibanda et al., 2007). Thus the continuous erosion of the agricultural labour force through morbidity and mortality impacts negatively on food security in the sub-region.

The nature and extent of the pandemic's influence on food security has not been fully explored (Sibanda et al., 2007). A lack of education or low educational level of most citizens in South Africa and neighbouring states in Southern Africa is associated with a low or no income and limited purchasing power for the affected individuals. Economic status is a major determinant of household food security (Briley, 1994) as it determines the purchasing power of a household.

One of the effects of HIV infection is a person's inability to go to work often, thus reducing household income (Sibanda et al., 2007). Inability to go to work often results in the infected person's inability or limited ability to provide for the household due to the progressive nature of the disease. This in turn affects the parents' ability to educate their children due to the need for children to take care of sick parent/s. Health care costs escalate (Sibanda et al., 2007) reducing the already limited resources to purchase food. The cycle of poverty ensues and the children in turn become poor adults.

HIV usually infects adults before their children. The incapacitating effect of HIV/AIDS adversely affects the parents' ability to fend for their households. The state then carries the burden of treating HIV infected persons who cannot afford to pay medical bills. When parents die, children have to fend for themselves before they acquire food production skills (Morris, 2003). Some children lose parents before they are able to produce, or prepare food for themselves. Since treatment for HIV is not an option due to the opportunistic infections, households may be compelled to sell their livestock and exhaust future savings in order to pay medical bills. By the time parents die, children have nothing left to live normal healthy lives.

The relationship between AIDS, poverty and food security is a vicious cycle, but women seem to be more vulnerable, as food insecurity may increase exposure to HIV when women and girls may engage in transactional sex in order to generate an income to feed their families (Wiesmann, 2006). Thus, poverty increases the risk of HIV infections among affected populations (Leyenaar, 2004; Gillespie et al., 2007). Another concern with vulnerability of the household to food insecurity in households is the fact that HIV infection occurs among parents before children are affected. Thus, eroding the provider base for the household and reducing the purchasing power of the household.

South Africa is the only country in the region that offers state pension and social grants to its citizens. However, with the high cost of medical care, state pension is inadequate to meet the needs of an average family as the cost of living is high. State pension of about a thousand rands translates to an income of a hundred US dollars per month. For a family of 5, each family member has approximately 20 US dollars per month, which is less than one US dollar per person per day. Infection of the economically active family members leaves the elderly with a burden to meet financial needs in the family. In cases where there is no elderly person in the household, or in child-headed families, the older child is left to fend for the younger siblings and dying parents. Children exposed to this situation become victims of sexual abuse. The child has to offer sexual favours in turn for money or food. Risky behaviour coupled with low purchasing power increases risk of HIV

infection. Low purchasing power of a household predisposes a household to inadequate food and nutrient intakes and ultimately poor nutritional health.

4. HIV and AIDS, nutrition and food security

Another adverse effect of food insecurity is its effect on the health of individuals and subsequently economic growth by reducing human capital. There is an association between low income, food insecurity and nutrient inadequacies (Kirkpatrick & Tarasuk, 2008). Nutrient inadequacies are responsible for numerous health problems as they compromise the immune system. Food insecurity has been associated with the consumption of poor quality diets, lower nutrient intakes, and the consumption of smaller servings of milk products, fruit and vegetables (Kirkpatrick & Tarasuk, 2008). Dietary compromise and a compromised nutritional status are therefore outcomes of food insecurity. People's ability to develop and sustain themselves is disrupted (Piot, 2003) by the 'twin' existence of HIV and AIDS pandemic and food insecurity.

Nutrition is an important component of comprehensive care for the HIV infected persons, particularly in rural areas where under nutrition and food insecurity are common (WHO, 2004). Poor nutrition accelerates morbidity and disease progression in HIV-infected persons.

Peter Piot (WFP, 2003: 1-2), Executive Director UNAIDS, said "I was in Malawi and met with a group of women living with HIV. As I always do when I meet people with HIV/AIDS and other community groups, I asked them what their highest priority was. Their answer was clear and unanimous: food. Not care, not drugs, not relief from stigma, but food". This statement and observation clearly demonstrates that food insecurity ranks very high among sufferings experienced by mankind. The explosion of the orphan population due to the rising prevalence of HIV/AIDS brings more food crises (Piot, 2003). An orphaned child is at risk of a poor nutritional state early in life, and such children's chances of getting well educated are compromised. It's either the children drop out of school early or they do not even become educated. HIV/AIDS has just added to the suffering that has been experienced by generations of underprivileged households and population groups. Poor households already struggling to fend for themselves now face serious threats to their infrastructure, work force and economies.

As food prices continue to rise, the cycle of poverty and hunger is perpetuated. Inability of a child to be educated or dropping out of school early in life affects future income potential and acquiring basic skills such as farming as farming skills are acquired through education. Lack of skills is evident in Africa where sufficient food is produced, but there are no food preservation and storage skills. Food preservation methods and the necessary skills that retain the nutritional quality of food are still lacking. Food production itself is a skill as there are pests and diseases that destroy farmers' produce, and farmers need appropriate technologies and skills relating to these in order to effectively manage pests and diseases.

The National Food Consumption Survey (2005) revealed inadequate energy intakes of macro- and micronutrients in children. For South African children as a whole, the dietary intake of the following nutrients was less than 67% of the Recommended Dietary Allowance: Energy, Calcium, Iron, Zinc, Selenium, Vitamins A, D, C, and E.

In South Africa, food insecurity is not only a problem in rural areas. With urbanisation, there are a lot of people who migrate from rural to urban areas. Urbanisation has both beneficial and adverse effects on the health of individuals. Adverse effects of urbanisation include poverty and a poorer lifestyle because of lack of proper accommodation and unemployment (Madava, 2000). As proper

accommodation is expensive, the majority of poor people live in informal settlements. Traditional diets characterised by low fat, high fibre foods, as well as high intake of vegetables and fruit, legumes and whole grains are now substituted for high fat, low fibres, low vegetable and fruit intake when rural people migrate to cities (Popkin et al, 2001, Tucker & Buranapin, 2001). This change in dietary behaviour is referred to as nutrition transition.

Good nutrition is the first line of defence in warding off detrimental effects of HIV/AIDS (Morris, 2003). With good nutrition, people living with HIV/AIDS (PLWHA) live healthier longer lives. A poorly nourished person is at risk of infection to this and other diseases as the body is not equipped to defend itself from invading infectious agents. When a poorly nourished person gets infected, two possibilities are that the person will either take a long time to recover or he / she will die. The relationship between the quality of diet and infection is cyclical. This is illustrated in Figure 2. The person infected with HIV gets worse each time, as the disease progresses from one stage to the next. Without proper nutrition, the disease progresses faster.

The relationship between immunity and nutrition is well established (Fenton & Silverman 2000). According to Figure 2, the infection attacks the immune system. As a result of the infection, the gastrointestinal system cannot function properly. The body is unable to digest, absorb or utilise food that has been consumed, due to diarrhoea. The presence of fever affects food intake and a person cannot consume sufficient food required to meet nutrient needs (FAO/WHO, 2002). In order to fight infection, nutrient requirements are increased, but the body is unable to provide the nutrients required to fight the infection. The person is now exposed to more infections such as tuberculosis, pneumonia, etc, as the immune system is further weakened (FAO/WHO, 2002). However, if a person who is infected is able to consume adequate food to meet nutrient requirements, the body is empowered to fight infection and to sustain life.

HIV/AIDS and nutrition

The process of HIV infection to the development of full blown AIDS occurs over a period of time, and this affects the quality of life of an individual. Good nutrition is critical to HIV/AIDS disease management (FAO/WHO, 2002). For an infected person to experience the benefits of medical treatment, a healthy diet is crucial. Nutrients that are lost through diarrhoea need to be replaced. An adequate energy intake is required to maintain weight and to prevent further weight loss. A balance of both macro- and micronutrients should be maintained to provide optimal health. Nutrient supplements are also provided when it is not possible to meet nutrient requirements through diet alone. In South Africa the larger percentage of the population are low income earners. In Sub-Saharan Africa, the main resource for land preparation is human beings (65%), 25% are animal traction and 10% is mechanised (Hunter, 2007). Most rural residents depend on agricultural food production, and this requires healthy people (Hunter, 2007). Thus HIV/AIDS adversely affect food production.

Among the devastating effects of HIV is the vertical transmission of the virus from mother to child through breastmilk (Kalings, 2008). Since women have the potential to transmit HIV to their infants during labour and through breast feeding, the health of women is addressed through prevention of mother to child transmission programmes. Pregnancy increases nutrient requirements for the pregnant person. Thus the presence of HIV infection increases the burden of nutrient requirements imposed by the pregnancy. And these increased requirements pose a challenge in settings where food security is a problem. If young women are healthy prior to becoming pregnant this increases the likelihood of a healthy child being born. This is one of many reasons why food security issues must be addressed throughout the life cycle.

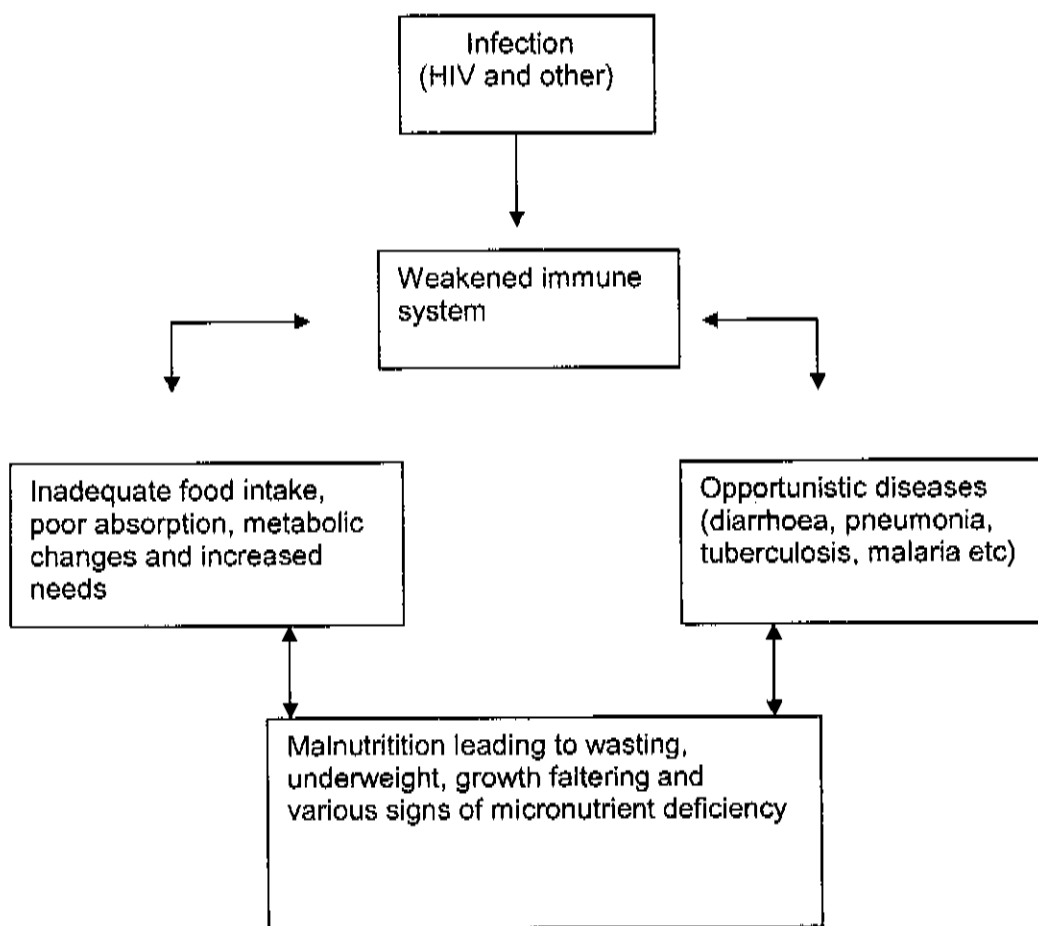


Figure 2: The cycle of nutrition and infection

Source: WHO, 2004

5. Daily nutritious meals

People living with HIV/AIDS require an adequate consumption of both macro- and micronutrients in order to fight infections and to enjoy healthy active lives (Morris, 2003). Healthy meals are not an exclusive right to the privileged. Both privileged and under privileged persons should enjoy healthy nutritious meals. Nutritious, balanced meals maximize HIV management, chronic debilitating conditions and prevent or delay loss of muscle mass. On the other hand, food insecurity limits food selection (Kirkpatrick & Tarasuk, 2008). The outcome of a healthy nutritious diet is the ability of the person living with HIV/AIDS to be able to perform daily activities of living and generate an income.

Macronutrients

The presence of an infection in the human body increases energy requirements and the increase is related to the stage of the HIV. Energy requirements increase by 10% in asymptomatic persons (WHO, 2005). This increase accommodates body weight maintenance and physical activity. In children increased energy requirements cater for growth needs. In symptomatic infected persons,

energy requirements increase by 20% to 30% to maintain adult body weight (WHO, 2005). In children who are losing weight, energy requirements can be as high as 50% to 100%.

The recommended protein intake for persons living with HIV/AIDS (PLWHA) is between 12% and 15% of total energy intake like in normal adults. There is no scientific basis for increasing protein intake for HIV/AIDS affected persons (National Guidelines, 2006). There are also no recommendations for increasing fat intake in PLWHA. 30-35% of total energy intake should come from fat.

Micronutrients

Micronutrients occur in small amounts in food (Gallagher, 2000). These are vitamins and minerals that are widely distributed in a variety of foods. Vitamins and minerals such as vitamin A, B-complex, C, E and selenium and zinc help the body to fight infections (Gallagher, 2004; Anderson, 2004). Antioxidant vitamins and minerals prevent oxidative stress (Banki et al., 1998), which accelerates immune cell death and prevents the HIV replication rate (Allard et al., 1998; Rosenberg & Fauci, 1990). Inability of infected persons to consume adequate food to meet nutrient needs requires that some nutrient supplements to be given to PLWHA. Such people, suffering from TB, should be given a multivitamin and mineral supplement that provides 100% of the recommended intake of these nutrients. Several benefits of short term antioxidant supplementation have been reported viz. improvement in body weight and body cell mass (Shabert et al., 1999), reduction in HIV RNA levels and improving CD4 cell count (Muller et al. 2000) and reducing the incidence of opportunistic infections. Improving the health status of PLWHA cannot be doubted as these persons through supplementation of diets may be unable to meet their dietary requirements through diet alone. Nevertheless, a nutritionally adequate forms the basis of optimum health. The Muller et al. (2000) do not claim that supplementation affects CD4 count or plasma viral load. The quality of life of PLWHA is however improved.

When a well nourished person is infected by HIV, the ability of the body to handle the infection is better than that of an undernourished person. Persons with HIV/AIDS have been reported to live long active years in countries where the populations are well nourished. Food security issues should be ensured in all households before the impact of HIV/AIDS is taken into consideration if the fight against HIV and AIDS in every country that is serious about combating the pandemic. Women play a major role in infant feeding. In South Africa and third world countries, breastfeeding is the safest mode of infant feeding as the majority of women cannot afford and provide safe formula feeding. However, the vertical transmission of the virus from mother to child leaves the safety of breastfeeding by infected mothers questionable. Breast feeding requires a well nourished mother. Formula or replacement feeding carries several health risks in developing countries. Unsafe drinking water makes formula feeding an unsafe feeding option. Formula feeding requires money to buy commercial products. If replacement feeding such as fresh animal milk is used, it requires households to have healthy animals (cattle and goats) that will provide the milk. When addressing food security, safe drinking water should be part of the plan in order to avoid gastroenteritis. The health of animals whose milk is used for infant feeding needs to be taken into consideration since diseases such as Tuberculosis (TB) can be transmitted from cattle to humans if the milk is not properly pasteurised (García, 2006). Cow or goat's milk can be a good alternative infant feeding option if communities who own livestock are educated about farming.

6. HIV and AIDS – Lessons for food security programmes

Findings of the NFCS (2005 Or 1999?) indicate a need for drastic measures aimed at addressing food security problems at household level. Food security programmes are classified into short- and long term measures. Acute problems are addressed through short-term, while the problem can be alleviated through long term measures. South Africa is currently implementing the following strategies in order to address food insecurity among the underprivileged: social grants, food parcels school feeding scheme, nutrient supplements for HIV-infected persons and food fortification. Food fortification¹ is done for the population at large in order to improve the nutrient density of commonly consumed foods. Maize is the staple food for the majority of South Africans. Since maize is deficient in niacin, pellagra used to be common in disadvantaged household. The Department of Health resolved to fortify maize meal with niacin. The first four strategies are short term as they may not be sustainable, and they will not ultimately solve the problem of hunger and under nutrition. The former Deputy President, Phumzile Mlambo-Ngcuka, as reiterated that the grants cannot be sustained. Distribution of food parcels is also a short term measure and it may be good for persons in stage 3 and 4 of HIV/AIDS disease (see appendix A). Providing nutrient supplements is beneficial as infected persons have a poor appetite. They are necessary to ensure a nutritionally adequate diet. However, supplements cannot be consumed alone. They are taken together with food. Regarding food fortification, the national Department of Health has identified foods that should be fortified with nutrients in order to improve micronutrient intakes of the population. Consumers need to be educated about the benefits of fortified foods and also what foods should be eaten in conjunction to maximise, rather than minimise, digestion of nutrients.

There are currently a number of organisations that are addressing food security in a variety of different ways. These include the World Food Programme (WFP), Food and Agriculture Organisation (FAO), United Nations Children's Emergency Fund (UNICEF), United Nations Educational, Scientific and Cultural Organisation (UNESCO), World Health Organisation (WHO) (WFP, 2007). The WFP promotes agriculture and crop production, land and water development and road development. It works in conjunction with the FAO. The FAO promotes agriculture and crop production, and they provide seeds and tools. UNICEF is also a partner for WFP in fighting child hunger, as well as increasing education, nutrition, combating HIV/AIDS and emergency relief. They focus on increasing primary school enrolment and retention for girls, reducing malnutrition and reducing the risk and burden of HIV/AIDS, especially for orphans and vulnerable children. UNESCO works in collaboration with WFP to promote education, particularly for girls through the school feeding scheme programme. They offer HIV/AIDS education and HIV prevention and other programmes. The World Health Organisation (WHO) focuses on public health, HIV/AIDS and technical assistance. They focus on nutrition strategies which improve education, health and nutrition. These organisations are focussing on long term measures of alleviating hunger and poverty.

The common denominator in the offerings of these organisations is their interest in developing capacity in the girl child, who is tomorrow's mother, to enable her to produce food, generate an income to feed her family, raise a healthy family, prevent HIV for a better world.

Gillespie and Kadiyala (2007) suggested the following actions to address challenges posed by HIV/AIDS:

- Encouragement of labour exchanges between households to reduce labour shortages
- Education of orphaned children in local farming techniques
- Consideration of the gender dimensions of market access to ensure widows' access to income generation

¹ Addition of nutrients in commonly consumed foods such as bread and maize meal during food processing by millers to enhance the food's nutritional value (Dodd & Bayerl, 2004)

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- Review of land tenure arrangements to protect rights of widows and orphaned children
- Integration of sexual health

In order to address HIV/AIDS and food security challenges, Gillespie and Kadiyala's suggested should be adopted. The subject of food security should start early during school years where children are taught about food gardens. School gardens will benefit the school feeding scheme if children grow vegetables, eat them and observe health benefits. The available land or space should be utilised to grow a variety of vegetables in the home and designated areas in villages. Agriculture should be a compulsory subject, particularly in rural schools as HIV is living more orphans than any other disaster had ever done. Labour exchange should be encouraged in farming communities.

South Africa has adopted food-based dietary guidelines for planning nutritious meals (DoH, 2006). The guidelines provide a wide variety of foods that meet nutritional requirements for children how plan nutritious meals (see annexure B).

South Africa has a social security programme which offers grants to the underprivileged. These grants are free handouts and they will neither impart any skills to underprivileged households nor help future generations. Grants are good for the elderly and the disabled and orphans, but long-term and multiple solutions for addressing food insecurity should be sought and implemented. social grants are a short term strategy as their sustainability is questionable. Food handouts are distributed by the department of social services. School feeding schemes should incorporate food production skills to learners. Any programmes that are aimed at reducing food insecurity should incorporate health, sanitation and education, particularly of females (Maunder & Wiggins, 2007). Food insecurity problem is multi dimensional in nature. Thus the solution should integrate various departments and community based organisations. Sustainability of food security programmes is a crucial if the curse of hunger is to be eliminated. In summary the following aspects should be covered in food security programmes – promoting school, community and home gardens, educating children, particularly young girls. School and community gardens should provide school meals for children in local communities. Communities should be educated about the significance of consuming fortified foods. Availability and access to nutritious food will eliminate challenges some of the challenges facing undernourished HIV infected persons.

Workshops that have been conducted by the author for the North West Provincial Department of Health in 2005 to 2007 revealed that there was a lack of coordination of efforts between the Departments of Health and Social Services. As a result, the nutritional quality of diets that were provided to HIV-infected persons was not prioritised. After a 3-day session on Nutrition and HIV, workshop that was conducted by the Department of Health, participants (community members), came up with the following food basket for a low income household of four (2 adults and 2 young children). The food basket suffices for a month.

- | | |
|--|-----------|
| • 25kg unrefined maize meal | @ R129.97 |
| • 2kg mabella meal | @ R16.78 |
| • 1 pocket potatoes | @ R49.50 |
| • 2kg Philani (morvite) | @ R23.58 |
| • 2.5kg samp | @ R16.65 |
| • 2kg Soya mince | @ R36.69 |
| • 3kg Dried beans, lentils, dried peas | @ R66.25 |
| • 5 dozen Fresh eggs | @ R63.50 |
| • 1 litre cooking oil | @ R35.99 |

- 800g Peanut butter @ R29.99
 - 1 kg tinned fish @ R49.46
 - 2 kg whole milk powder @ R77.98
 - 500g Salt @ R3.19
 - 2.5kg sugar @ R15.98
 - 200 teabags Tea (tranco) @ R29.99.
 - Fresh fruit and vegetable² to be obtained from local supplier or home garden daily or on a weekly basis
- Total (excluding fruit and vegetables) = R645.52

This food basket makes provision for a variety of foodstuffs and meets basic nutritional requirements at low cost. Both macro- and micronutrients are consumed on a daily basis. This basket (modified as needed) can be the basis for developing and improving current dietary practices in order to improve food security, nutritional and health status of HIV infected persons, plus the general healthy population.

7. Conclusion

HIV/AIDS can be tackled if communities participate in addressing food security challenges. Provision of antiretroviral drugs alone will not address the problem. The solution for HIV/AIDS and food security requires a multisectoral approach. This includes ministries of health, education, agriculture, social services, corporate sector, faith organisations etc. Communities need to be made aware that agricultural skills are essential in improving the health of both healthy and infected persons, and economic development of a nation. Through a nutritionally balanced diet, infected persons can live longer healthier lives and continue to be economically active. Healthy people who are well nourished are better able to fight infections than poorly nourished ones. The solutions for HIV/AIDS and food security should be categorised into short-, medium- and long term and basic issues that require immediate attention be prioritised addressed. Major aspects of the solution such as climate changes, economic issues and water sanitation and safety that need a multisectoral approach should receive attention in future national and regional plans.

This paper therefore proposes the establishment of a team comprising agricultural officers, veterinary surgeons, nutritionists, health professionals, economists, researchers, educationists and community members to conduct action research that will address food security and HIV challenges. The team should work together to improve food security in South Africa. In order for the programme to be effective, decision makers should be co-opted into the team. The team will also assist in developing a comprehensive school curriculum that produces a population and a workforce that is capable of addressing HIV/AIDS and food security challenges.

² Wild fruit and vegetables and home grown available in some rural areas

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Annexure A

WHO disease staging system

In 1990, the World Health Organization (WHO) grouped these infections and conditions together by introducing a staging system for patients infected with HIV-1. An update took place in September 2005. Most of these conditions are opportunistic infections that are easily treatable in healthy people.

- Stage I: HIV infection is asymptomatic and not categorized as AIDS
- Stage II: includes minor mucocutaneous manifestations and recurrent upper respiratory tract infections
- Stage III: includes unexplained chronic diarrhea for longer than a month, severe bacterial infections and pulmonary tuberculosis
- Stage IV: full-blown AIDS. This stage includes toxoplasmosis of the brain, candidiasis of the esophagus, trachea, bronchi or lungs and Kaposi's sarcoma; these diseases are indicators of AIDS

Annexure B:

Food-based dietary guidelines

The food-based dietary guidelines (DoH, 2006) that have been adopted in South Africa are:

- Enjoy a variety of foods.
- Be active.
- Make starchy foods the basis of most meals.
- Eat plenty of fruit and vegetables.
- Eat dry beans, peas, lentils and soya often.
- Meat, fish, chicken, milk and eggs can be eaten every day.
- Eat fats sparingly.
- Use salt sparingly.
- Drink lots of clean, safe water
- If you drink alcohol, drink sensibly.