COMBATING MALNUTRITION IN SOUTH AFRICA

Input paper for Health Roadmap

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Summary

South Africa like other developing countries is in nutrition transition which includes the coexistence of under- and over-nutrition and has a malnutrition problem of public health significance. Despite various national nutrition and primary health care programmes being initiated in South Africa over the last decade, recent findings have indicated that child malnutrition rates and hence child health has deteriorated. At the national level, stunting and underweight remain the most common nutritional disorders affecting 1 out of 5 children and almost 1 out of 10 children respectively. Also 10% of the children were classified as overweight and 4% as obese. While, iodine and folic acid status appear to be adequate uniformly throughout the country, almost one third of women and children were anaemic, 2 out of 3 children and 1 out of 4 women had a poor vitamin A status and 45.3% of children had an inadequate zinc status. Poor dietary intake, food insecurity and poor quality of basic services prevail within the context of an HIV/AIDS pandemic.

The national Integrated Nutrition Programme (INP) is a comprehensive nutrition strategy that focuses on children under 6 years old, at-risk pregnant and lactating women, and those affected by communicable and non-communicable diseases. The challenge for public, private and civic leaders is to scale-up the interventions and technologies that have being proven to work viz. focusing on children under age two years; improved infant and young child feeding; and micronutrient control programmes; and focusing investments on the critical 'window of opportunity' by integrating and prioritizing nutrition more effectively into national Poverty reduction Strategies and development budgets, supporting community-based programs, strengthening public health systems and building health capacity more generally.

This report summarises the progress that South Africa has made in reducing malnutrition; explores some of the main reasons why greater progress has not been made and presents some suggestions for policy priorities to effectively address the nutrition issues that have been identified. The INP will need to prioritize and strategize to improve breastfeeding and especially exclusive breastfeeding rates; improve on infant and young child feeding interventions along the line of the South African Paediatric Food Based Dietary Guidelines; focus on the identification and appropriate management of paediatric obesity; improve on micronutrient deficiency control programmes at scale and invest in rigorous monitoring and evaluation for effective data for decision-making. The current efforts on nutrition surveillance in the country should be reassessed, strengthened and formalized. All this cannot be achieved unilaterally by the INP therefore multi-sector partnerships are imperative for South Africa to reduce malnutrition and accelerate efforts to meet the MDGs.

Introduction

Poverty and poor nutritional intake are significant causes of the high levels of poor infant and child physical growth and development. Poor nutrition has been implicated in delayed cognitive development; long-term damaging effects on infant and child intellectual and psychological development; severe infection; and because under-nutrition is a major contributor to the chances that an infant and child will succumb to a life threatening disease, it is estimated that poor nutrition accounts for about 70% of under-5 mortality in the developing world.[1]

Malnutrition is not only an urgent global health issue. It is also an impediment to productivity, economic growth and poverty eradication. It is estimated 32% of the global burden of disease would be removed by eliminating malnutrition, including micronutrient deficiency. It is for this reason that in 1990, 189 United Nations' member states committed to a set of eight Millennium Development Goals (MDGs) comprising of 18 targets that were later adopted in 2000 by the United Nations as part of the Millennium Declaration. The first MDG is directly related to eradicating hunger and malnutrition but many of the MDGs such as improving education; reducing child mortality; improving maternal health; and combatting HIV and AIDS, malaria and other diseases all require good nutritional status if they are to be achieved efficiently [2].

Recent findings from the Lancet have highlighted evidence based interventions to make this positive change "…group of effective nutrition interventions, including breastfeeding, complementary feeding, vitamin A and zinc could save 2.4 million children each year (nearly 25% of the 10 million under-five deaths)".[3] There are now proven interventions and technologies to tackle under-nutrition and micronutrient deficiency, and growing evidence on how to implement cost-effective and affordable programs on a large scale. The challenge is collective action by public, private and civil society to focus investments to improve the broader environment to integrate and prioritize nutrition more effectively.

In 1995, when the South African Department of Health initiated the Integrated Nutrition Programme (INP) to address and prevent malnutrition with the vision of optimal nutrition for all, it did so through a comprehensive approach to address the underlying causes of malnutrition through direct (e.g. nutrition education and promotion; micronutrient supplementation; food fortification; and disease-specific nutrition counselling and support) and indirect (e.g. provision of healthcare services; improved access to food; parasite control and provision of clean and safe water)

[1] SCN Working group Nutrition throughout the Lifecycle (2003). www.unsystem.org/SCN/Publications

[2] UN Millennium Project. (2005). *Investing in Development: A practical plan to achieve the Millennium Development Goals*, UNDP, New York Millennium Project reports accessed at http://www.unmillenniumproject.org/reports/index.htm

[3] The Lancet Child survival series (2003). *www.thelancet.com*

nutrition interventions which includes service delivery as well as aspects of behaviour change[4].

South Africa is in a nutrition transition which includes the coexistence of under- and over-nutrition which is evident between and within populations and across age groups.[5] Within the context of the HIV/AIDS pandemic and the worsening food insecurity, the high prevalence of under-nutrition, micronutrient deficiencies and emergent over-nutrition presents a complex series of challenges for health workers and policy makers. While the INP has achieved much since it's inception in 1995, the recent shared findings from the 2005 National Food Consumption Survey – Fortification Baseline leaves no room for complacency and provides policy-makers, practitioners and service providers the impetus to re-evaluate the INP and its progress in order to accelerate South Africa's efforts to address malnutrition and meet the MDGs.

This report summarises the progress that South Africa has made in reducing malnutrition; explores some of the main reasons why greater progress has not been made and presents some suggestions for policy priorities.

[4] Department of Health (2008). Integrated Nutrition Programme. A foundation for life. Issue 5. Department of Health: Pretoria

[5] Steyn, et al (2006). Dietary changes and the health transition in South Africa: Implications for Health policy. South African Medical research Council: Cape Town

Repositioning nutrition central to development

Nutritional status of children is usually described in terms of anthropometry or body measurements such as weight in terms of age or height which respectively would be a measure for the degree of underweight (low weight for age) or wasting a measure for the degree of acute thinness. Height in terms of age would be a measure of stature in which too short in length for age is indicative of long-term and chronic malnutrition. Nutritional status of children is a very good proxy indicator of the state of health of a community or population.

While much is known about what can make a difference in child nutrition, such as food, access to health services and good care, especially in early childhood[6], no programme in South Africa can be planned without considering how it will be influenced by, or how it will influence the HIV/AIDS epidemic and the response to the epidemic. The drive for nutrition will involve working across sectors, recognizing for example that water, sanitation and access to health services are inextricably connected with child health and nutrition. Nutrition programming involves efforts that span the micro level at household level to the macro level at policy level and will require every level of society to work in partnership. The priority of nutrition interventions must be children under two years old, when they are most vulnerable to disease and mortality. Early childhood offers a window of opportunity; nutrition-related interventions during this period have the greatest impact.[7]

Findings from the NFCS[4] and the NFCS-Fortification Baseline[8] both reported the younger child, 1-3 years of age, as the most vulnerable with respect to poor nutritional status. In addition, interventions need to focus on women – before they become pregnant, while pregnant and when lactating – through antenatal care and other opportunities, because mothers deprived of good nutrition are likely to give birth to underweight babies.[8] The health and nutrition needs of populations in complex emergencies must remain on the agenda such as in natural and man-made disasters. New evidence indicates that if high-impact health and nutrition interventions such as breastfeeding, complementary feeding and vitamin A and zinc supplementation are scaled up, they will have a synergistic impact on growth and development, as well as survival.[9, 10]

The last two decades have witnessed dramatic changes in the conceptualization of the problem of malnutrition- first, the realization that malnutrition is a problem to be solved and not just a medical condition to be studied. This has led to the current efforts that emphasize more at looking at solving the malnutrition problem than just studying it and to ensure that nutrition research, training and programmes are

[6] UNICEF (1990). Strategies for improved nutrition of children and women in developing countries. UNICEF: New York
[7] *The Lancet* series on child survival (2003) and neonatal survival (2005);
[8] Labadarios, D et al, (2008). Executive summary of the National Food Consumption Survey Fortification Baseline (NFCS-FB-I) South Africa, 2005. South African Journal of Clinical Nutrition, 2008; 21(3) (Suppl 2): 245-300
[9] Copenhagen Consensus 2004 reports accessed at http://www.copenhagenconsensus.com
[10] The World Bank (2006). Repositioning Nutrition as Central to Development: A strategy for large-scale action, Directions in Development, The International Bank for Reconstruction and Development/The World Bank, Washington, D.C.

effectively linked between and to each other. Secondly, a paradigm shift, where the problem is looked at from a more holistic perspective, than previous efforts that were looking for a medical perspective for 'a one magic bullet' solution mainly from the food or health sectors. Thus in any particular situation, a broad causality analysis should precede actions. The result is that there is increasing cooperation in addressing the problem among various institutions and between various disciplines and the recognition that those affected, the poor, are part of the solution, rather than part of the problem. Where nutrition programmes have applied this conceptual shift, spectacular improvements in the nutrition status of populations have been recorded, even countries with low per capita incomes have made significant progress where appropriate policies are matched by political will, as demonstrated in the recent World Bank publication which advocates that nutrition needs to be repositioned in national development if the MDGs are to be achieved.

There is now more understanding of what works, why and how it works, and in general, there is enough knowledge to substantially address the problem of malnutrition.[11] However, there seems to be a big gap between theory and practice and between knowledge and application. Successful efforts have largely remained small scale; their lessons have been documented and mainly filed. The 'magic bullet' solution which is supposed to result in ground breaking outcomes still lingers. So not enough resources are provided and the problem of malnutrition continues to be an embarrassing one for the world. There is no question, however, that carried to large scale, the holistic approach to addressing the problem of malnutrition that has proven so successful at small scale with emphasis at community capacity building will result in the great leap forward that we are all looking for.

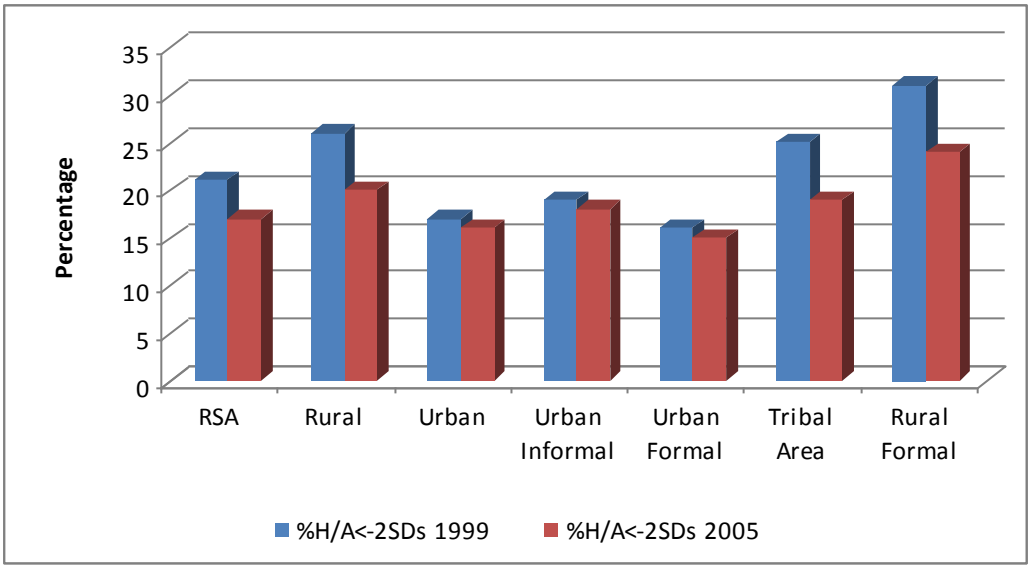
[11] ZA Bhutta, T Ahmed, RE Black, S Cousens, K Dewey, E Giugliani, BA Haider, B Kirkwood, SS Morris, HPS Sachdev, M Shekar, for the Maternal and Child Undernutrition Study Group - *2 (2008).* **What works? Interventions for maternal and child undernutrition and survival** *February 2008 (Vol. 371, Issue 9610, pages 417-440) www.thelancet.com*

Defining the size and the extent of the malnutrition problem in South Africa

Prevalence of underweight for age and stunting in children

There have been two national nutrition surveys in the last 10 years: The 1999 National Food Consumption Survey (NFCS)[4] and the 2005 NFCS-FB-I[11] Comparing the results of the two surveys shows that stunting and underweight remain by far the most common nutritional disorders affecting almost one in five and almost one in ten children respectively. As shown in Figure 1, the national average prevalence of stunting has decreased from 21.6% to 18% with the overall best improvement in the rural areas (26.5% to 20.3%).

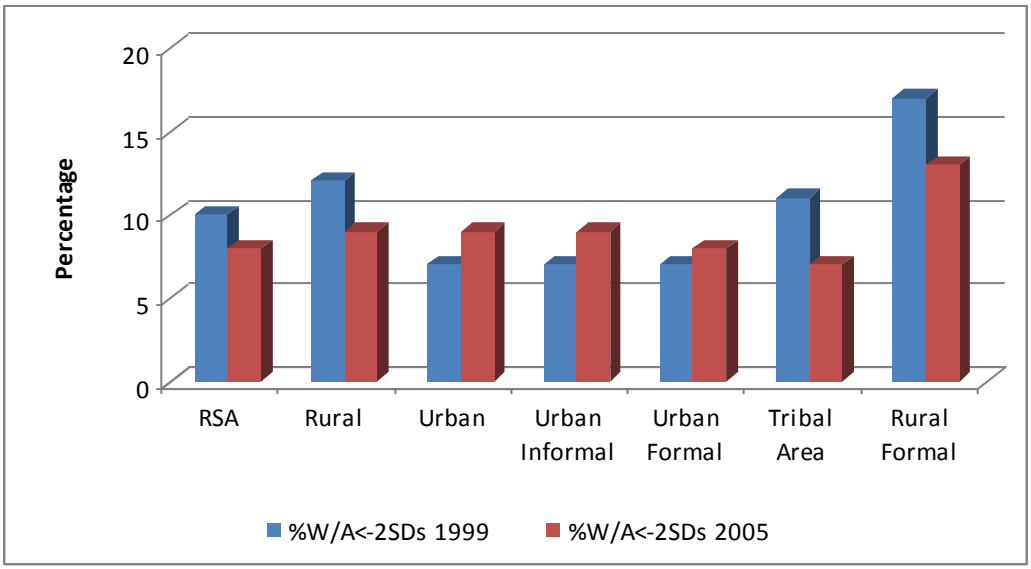
Figure 1. Comparison of stunting for children aged 1-9 years nationally and by area of residence: South Africa 1999 and 2005



Stunting has a positive correlation with age. In 2005, stunting decreased from 23.4% in children 1-3 years old; 16.4% in the age group 4-6 years and 12% in children 7-9 years.

Figure 2 shows data for the prevalence of underweight from the 1999 NFCS and the 2005 NFCS-FB-I. Despite the national prevalence remaining statistically unchanged at 9.3%, the prevalence of underweight appeared to have increased in children living in the urban areas, and decreased in the rural areas, with the greatest improvement among children living in formal rural areas (18.1% to 12.9%).

Figure 2. Comparison of underweight for children aged 1-9 years nationally and by area of residence: South Africa 1999 and 2005



At the provincial level the prevalence of both stunting and underweight was the highest among children in the Northern Cape (27.7% stunted, 38.3% underweight) and the Free State (28.2% stunted, 14.1% underweight). Likewise as shown in Figure 3, national prevalence of wasting remained statistically unchanged but appeared to have decreased in rural areas (4.9 – 3.8%), but more than doubled in urban areas (2.4 – 5.1%).

Figure 2. Comparison of underweight for children aged 1-9 years nationally and by area of residence: South Africa 1999 and 2005

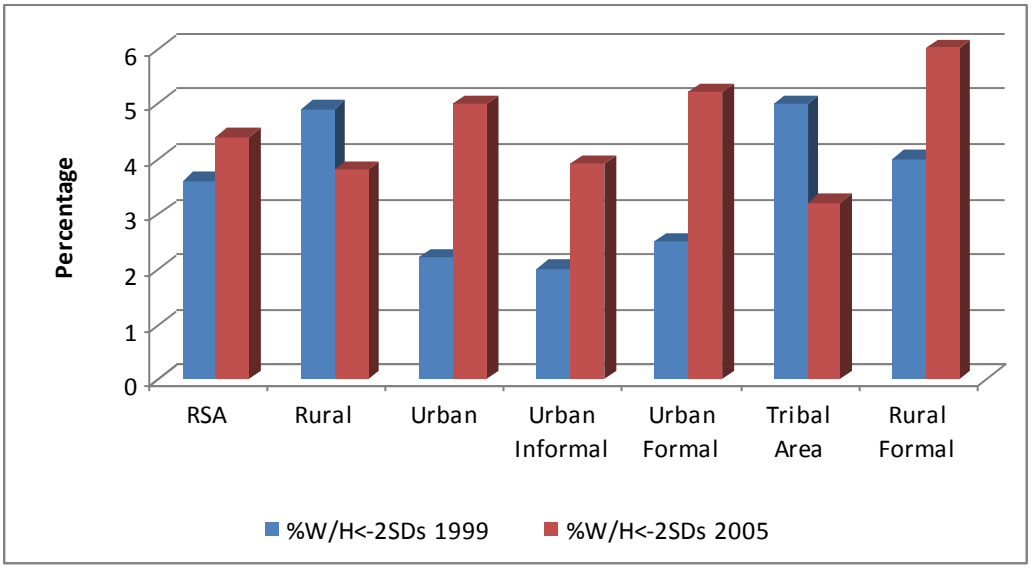
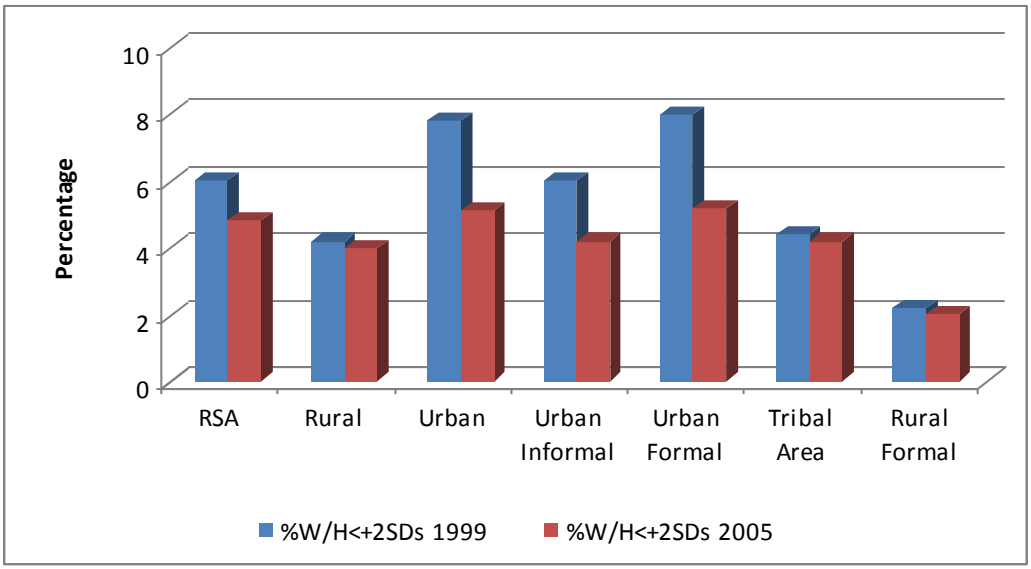


Figure 3. Comparison of overweight for children aged 1-9 years nationally and by area of residence: South Africa 1999 and 2005



At 4.8% Figure 3 shows a marginal reduction at the national level for overweight in children based on weight for height z-scores, with the highest overweight prevalence in urban formal areas at 5.5%. When the Body Mass Index (BMI) cut-off points proposed for international use were used, then 10% of children were classified as overweight and 4% as obese. The highest prevalence of overweight and obese children are in the age group 1-3 years (19.3%) and those living in urban formal areas (15%). With respect to stunting and underweight children in the age group 1-3 years and the Free State, Northern Cape and Limpopo province, in particular need attention. As shown in Table 1, nationally prevalence of severe stunting, wasting and underweight remained generally low and stable. Overweight and obese is a concern for Gauteng, KZN and the Eastern Cape.

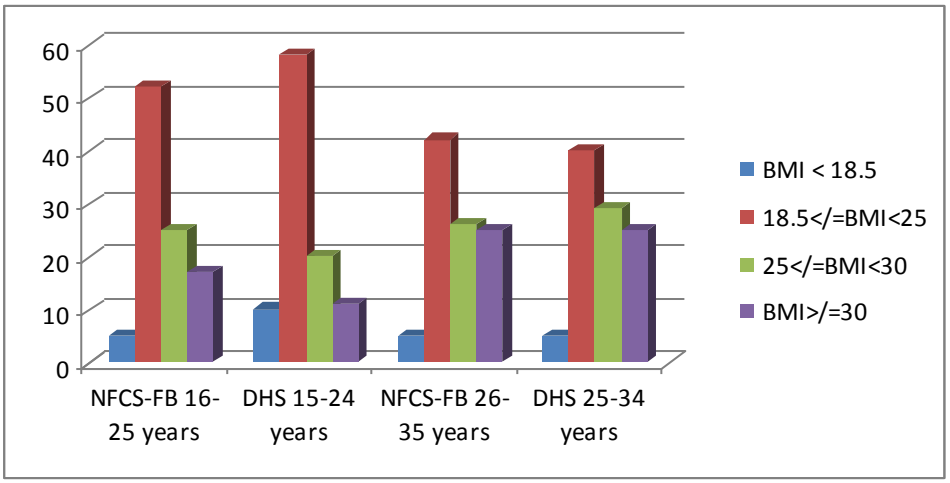
Table 1. The prevalence of moderate and severe malnutrition of children 1-9 years of age nationally and by province

Anthropometric Parameter	Province									
	EC	FS	GP	KZN	MP	NC	LP	NW	WC	RSA
%H/A<-2SDs	18.0	**28.2**	16.8	15,1	17.1	**27.7**	**23.8**	15.1	12.0	18.0
%W/A<-2SDs	7.8	**14.1**	6.4	5.0	10.9	**38.3**	**12.3**	**12.4**	8.2	9.3
%W/H<-2SDs	4.1	2.8	3.3	1.3	**7.5**	**19.1**	4.4	3.2	**11.5**	4.5
%H/A<-3SDs	**6.5**	**7.0**	5.2	3.0	5.7	**8.5**	**8.3**	4.9	0.5	5.1
%W/A<-3SDs	-	**2.2**	0.8	0.5	0.6	**4.3**	**2.0**	**1.6**	0.5	1.0
%W/H<-3SDs	1.4	-	1.0	-	2.3	-	0.4	-	**4.4**	1.0
%W/H>+2SDs	**6.1**	1.4	**6.4**	**6.3**	3.4	-	2.4	4.9	3.3	4.8

Prevalence of under and over weight amongst women

For the very first time, the NFCS-FB-I has provided nutritional indicators for women of child-bearing age defined as women 16-35 years of age. Figure 4 shows comparison data of women's BMI with the 2003 National Demographic and Health Survey.[12] Nationally the prevalence of women with chronic energy deficiency (CED) as defined by BMI <18.5 was 4.6% with the highest provincial prevalence in the Northern Cape 16.7% followed by the Limpopo Province at 7.9%. The percentage distribution between underweight, normal weight, overweight and obese subgroups was similar in the present study and the DHS for the age groups older than 25 years, but a higher prevalence of combined overweight and obesity was found in the age group 16-25 years in the NFCS-FB-I than in the DHS (42.2% vs 31.2%). Nationally the combined prevalence of overweight and obese women was 51.5% with the highest provincial prevalence in the Western Cape (58.7%) with one in two women overweight or obese in the Free State, Gauteng, the Eastern Cape and KwaZulu-Natal.

Figure 4. Comparison of Body Mass Index of women in he NFCS-FB and the Demographic and Health Survey (DHS), 2003



[12] Department of Health (2003). The Demographic and health survey 2003. DoH: Pretoria, South Africa. Available at www.doh.za/docs/index.html

Prevalence of micronutrient deficiencies

The 1999 NFCS, reported that in general one out of two children had an intake of approximately less then half of the recommended level of energy as well as of a number of important micronutrients. The majority of children consumed a diet deficient in energy and of poor nutrient density to meet their nutritional needs. This pattern of intake was worst in the rural areas. Among others, energy, calcium, iron, zinc and vitamin A were consumed at less than 67% of the Recommended Dietary Allowances (RDAs). The 2005, NFCS-FB-I did not collect dietary intake data but biochemical analysis were conducted to determine micronutrient status of iodine, iron, zinc and vitamin A.

Vitamin A status
Nationally, two out of three children and one out of four women had a poor vitamin A status. The prevalence of a poor vitamin A status in children in the country appears to have increased when compared with previous national data. The authors caution however, that these results should be interpreted with great caution and with due considerations to the known limitations of such comparisons.

Given that the prevalence of infection/inflammation did not contribute significantly to the low blood vitamin A concentration and that the pattern of increased prevalence in poor vitamin A status appeared uniform irrespective of the area of residence, age and province is an issue of grave concern and should receive due attention at the highest level possible. In addition to the high prevalence of poor vitamin A status, the national vitamin A supplementation programme coverage was found to be only 20.5% for children 1-4 years.

Iron status
Nationally, one out of five women and one out of seven children had a poor iron status. Almost one third of women (29.4%) and children (27.9%) were anaemic on the basis of haemoglobin concentration, with moderate and severe anaemia being relatively uncommon. Iron deficiency anaemia was 10.5% and among children 7.6%. The prevalence of a poor iron status in children appeared to have increased when compared with previous national data. The authors caution however, that these results should be interpreted with great caution and with due considerations to the known limitations of such comparisons.

Given that the prevalence of infection/inflammation did not contribute significantly to the low blood iron concentration, the pattern of increased prevalence in poor vitamin A status and the high prevalence of reported experience of hunger urgent attention must be given to food security at the household level.

Zinc status
Nationally, 45.3% of the children had an inadequate zinc status and given the high prevalence of stunting children of this age group should be considered to be at risk of zinc deficiency. In adequate zinc status was more prevalent among the youngest children and those living in rural formal and urban formal areas. Provincially, the Western Cape had the highest prevalence of inadequate zinc status, with Mpumalanga and Limpopo provinces having the lowest one.

Iodine status
Based on the median urinary iodine concentration of women and children, South Africa has essentially achieved the virtual elimination of Iodine Deficiency Disorder. At both the national and provincial level there has been a consistent increase since 1998 in the percentage of households using and consuming salt with an iodine content of more than 15ppm. However, the Limpopo Province needs special given that it had both the lowest mean iodine concentration at 20ppm and the lowest percentage of households with adequately iodized salt (45.3%).

Nationally, four out of ten women and five out of ten children had a urinary iodine concentration in the excessive category of iodine status. The Northern Cape Province had the highest mean iodine concentration in drinking water (196.6µg/L) followed by Limpopo Province (64.8 µg/L) and the highest percentage of women (83.3%) and children (95%) with a mean urinary concentration in the excessive category of iodine status.

Folic Acid
On the basis of mean serum and red blood cell folate concentrations, folic acid status would appear to be adequate uniformly throughout the country.[11] It was reported that there appears to be a 40% decrease in the prevalence of neural tube defects which may be attributed to the improved folic acid status but this needs further investigation.[13]

It would appear that the micronutrient status of children 1-9 years has at best remained unchanged. Except for iodine and folic acid, the status of micronutrients of public health importance vitamin A, iron and zinc all seem to have deteriorated. While it is recognized that food fortification programmes by their nature take time before a positive impact can be expected. However, in the context of the high food insecurity, the high disease burden of the nutrition transition and HIV/AIDS it would be timely and proactive to invest in strengthening the current efforts of the INP.

Double burden

The nutrition transition is reflected in the increasing global prevalence of both obesity and physical inactivity as major risk factors contributing to the burden of chronic disease. The developing world is faced with the challenge of the dual burden of disease: non-communicable disease juxtaposed with infectious disease, childhood stunting and under-nutrition. With urbanization physical activity levels demonstrably decrease and there is an associated increase in the energy density of the diet. These changes are typically accompanied by increased prevalence of obesity, impaired glucose tolerance, hypertension and other cardiovascular risk factors. In the past, chronic diseases of life-style was viewed as an adult problem and an emphasis on the problem of under-nutrition may well have led to overweight not being investigated in children.

[13] Labadarios, et al. (2008). Folate, iron, vitamin A and zinc status of children 12-108 months and women 16-35 years old in South Africa: the national food consumption survey-fortification Baseline. Abstract 70. 2008 Nutrition congress: Evidence based Nutrition Leading the Way in Innovation. 28 September – 2 October 2008. Pretoria, South Africa p202

In 1994, 9.0% of children aged 3-6 years, from a representative sample of African children in Cape Town, were reported to be overweight. In 2005, Steyn, et al reported on secondary analyses of the 1999 NFCS data that the prevalence of combined overweight and obesity (17.1%) for this age group was nearly the same as that for stunting 21.6%. The NFCS-FB-I reported for the same age group based on the international BMI standard that the prevalence of combined overweight and obesity was 19.3%. And for women 16-35 years, the prevalence of combined overweight and obesity was 51.5%. Underscoring the need for health promotion strategies aimed at prevention of both obesity and associated co-morbidities, as South Africa moves rapidly through the nutrition transition.[7]

Why we do we continue to have high levels of malnutrition?

Link with poverty and food security

Not surprisingly levels of malnutrition are significantly and consistently associated with socio-demographic parameters such as household monthly income, weekly expenditure on food, employment status of the respondent, and hunger risk classification. Clearly demonstrating and underscoring the link between poverty and poor health and nutrition outcomes and vice versa.

In 2001, South Africa's Gross Domestic Product corrected for Purchasing Power Parity placed it as one of the 50 wealthiest nations, however the country has an unequal economy, rated as the third most unequal in the world. South Africa's Gini coefficient rose from 0.69 in 1996 to 0.77 in 2001. Statistics South Africa 2007 reported unemployment at 25.5%, with only 41.9% of people of working age having jobs. However, according to the South Africa MDG country report, using expenditure-related indices, particularly the Living Standards Measurement (LSM) of the SA Advertising Research Foundation reported that the proportion of poorest South Africans had decreased. [14]

In 2007, South Africa reported on measures to eradicate extreme poverty including the social assistance grants, which increased from R10 billion in 1994 to R37.1 billion in 2004 with beneficiaries growing from 2.6 million to 7.9 million during the same period. Other interventions that were successful included the Expanded Public Works Programme (EPWP), the Agricultural Starter Pack Programme and the Comprehensive Agricultural Support Programme (CASP).[2] Despite these successful initiatives the NFCS-FB-I reported that 85% of the women respondents were unemployed. Unemployment was highest in Limpopo (93%), Mpumalanga (92%) and the Eastern Cape (91%). Nationally, more than one in two households (55%) had a monthly income between R1 – R1000 with urban informal households reporting the highest percentage of no income (6%) as well as an income of R1 –R1000 (35%). The authors concluded that a significant percentage of the country's population still live an adverse socio-economic conditions.[11]

Furthermore, the NFCS-FB-I findings reported that despite South Africa's middle-income status and impressive wealth ranking, at the national level, one out of two households (51.6%) experienced hunger as determined by the hunger scale, approximately one out of three was at risk of hunger and only one out of five appeared to be food secured. At the provincial level, the prevalence of households experiencing hunger was highest in the Eastern Cape, Northern Cape and Limpopo each with six out of ten households. The report states that at best, the prevalence of hunger had not improved since the findings of the NFCS in 1999. Households at risk or experiencing hunger tended to be of the informal dwelling type, had the lowest monthly income and spent the lowest amount of money weekly on food. Mothers from these households also had the lower standard of education. There was an overall consistent correlation between anthropometric status (H/Az, W/Az, W/Hz) with

[14] Statistics South Africa (2007). Household income and expenditure survey 2005/6

sociuo-demographic parameters such as household monthly income, weekly expenditure on food, employment status, education level of the mother and hunger risk classification. This may in part explain the increase in the prevalence of wasting particularly in the urban areas and in the Northern Cape Province.

Worsening food security and HIV/AIDS

Background to Food Insecurity in South Africa

There is evidence in South Africa that AIDS is having a significant effect on agriculture and on food security. According to the South African government, food security "is achieved when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food, to meet their dietary needs and food preferences for an active and healthy life" (World Food Summit, 1996). Achieving this involves:

- Food availability: ensuring that a wide variety of food is available both nationally and within local markets and fields;
- Food accessibility: people are able to produce or purchase sufficient quantities of foods that are nutritionally adequate and culturally acceptable, at all times;
- Food utilisation: food is stored, prepared, distributed and eaten in ways that are nutritionally adequate for all members of the household, including men and women, girls and boys; and
- Food stability: maintaining the availability, accessibility and utilisation of food over time in the face of a variety of natural, economic, social and policy shocks and stresses.

All aspects of this definition have been affected by HIV and AIDS leading to food insecurity and greater vulnerability to hunger for some groups of the population.

The growth of the South African economy has contributed significantly to improving food security across the country since 1994, particularly as most citizens access food via purchase. Despite an overriding perception that food security is about agricultural production, it is clear that the cause of hunger and malnutrition in South Africa is not overall shortage of food but access to food by certain parts of the population (Polzer and Schuring, 2005). Even in rural areas, most households are net deficit food producers, as their access to food is partially or wholly reliant on household income. As a result, food security is largely about direct or indirect access to cash to purchase food. The majority of income of rural households is accrued in the form of employment, remittances from migrant workers and from welfare payments. The impact of HIV and AIDS can clearly have a direct impact on these pathways to food security.

Among the poor, who by definition suffer the brunt of the lack of jobs in the South African economy, the main sources of cash are insecure piece jobs, the government social welfare safety net of old age pensions and child support grants, and private transfers from working relatives and neighbours. Economic growth has been complemented by an effective social protection policy that provides grants to a range of vulnerable groups. There has been a significant increase in social grants between 2002 and 2004, and which are likely to continue to substantially increase the incomes

of the poor. The robust performance of the economy since 1994 has contributed to strong growth in government revenue and arguably enabled the government to provide an expanded welfare safety net.

However, despite a strong government commitment to addressing development issues in South Africa, tremendous disparities in food security exist between communities and households across the country, reflecting continuing social and economic inequalities. Estimates suggest that approximately 14 million people are food insecure and 1.5 million children suffer from malnutrition (HSRC, 2004). Despite interventions, there are signs that there is increasing food insecurity in specific places, largely poverty nodes in both rural and urban contexts, related to increasing unemployment, food price increases, HIV and AIDS, and adverse environmental conditions and poverty in general. As a result, it can be argued that food insecurity is not an exceptional, short-term event in the lives of many South Africans, but a continuous threat for more than a third of the population.

Part of the reason for this is that agricultural production at the local level has been marginalised and that the rural poor are decreasingly engaging in agricultural production. There are a number of reasons for this including access to agricultural land and inputs, including labour, and biophysical factors. In addition a decrease in agricultural knowledge, inappropriate extension services, poor credit facilities, HIV and AIDS, climate change and increasing water pressures have exacerbated the situation. Perceptions about the value of engaging in agriculture have also shifted with the changes in culture and livelihoods that are partly synchronous with these constraints.

Impacts on the commercial agricultural sector

Apart from the impact on land-based livelihoods and subsistence or small-scale agriculture, there are significant repercussions for the commercial agricultural sector as well. This sector provides the bulk of foods for national food security through ensuring availability of food.

The situation of farm workers in South Africa serves to further elucidate food access issues that can shape inequality of food security Farm workers account for 45.8% of the population classified as rural (May et al., 1998). They are among the most vulnerable population categories with regard to income, health status, household nutrition security and education and are trapped in a vicious circle of relative deprivation, with low education levels, lack of alternative employment opportunities and lack of access to public services (Vorster et al., 2000; Lemke, 2001; Kruger et al., 2006). This creates an ambivalent situation, with farm workers experiencing constraints but remaining reliant on farm owners, who recognise the necessity to enhance the quality of life of farm workers, but often lack the resources or capacity to implement changes (Lemke, 2005).

Research revealed that households with higher and more diversified wages, women earning an income, access to town and availability of food stores, possession of property and savings, and food production are more likely to be secure, while food production in general plays a minor role (Lemke, 2005). A review on AIDS' impacts on rural livelihoods in sub-Saharan Africa revealed that programming directions are

often wrongly built on the assumption that agricultural production is a mainstay of rural people, and as a result rural non-farm households are not covered in the studies (Murphy et al., 2005). Only recently has the situation of farm workers received greater attention, which might partly be due to the rapid transformation of the agricultural sector and the sensitive political situation with regard to the current process of land reform.

Poor breastfeeding practices

Breastfeeding makes a major contribution to child health by protecting infants from morbidity and mortality associated with common infectious diseases. According to scientific evidence, exclusive breastfeeding reduced under-five mortality by 13 percent (Jones et al., 2003). A WHO pooled analysis of studies found that compared with infants who are exclusively breastfed infants aged 0-5 months who are not breastfed have six-fold and two-and-a-half-fold increased risks of death from diarrhoea and pneumonia respectively (WHO Collaborative Study Team, 2000). A recent study from Hlabisa, South Africa has established that exclusive breastfeeding substantially reduces the risk of HIV transmission from an infected mother to her infant. Another study from Malawi that assessed the impact of breastfeeding by women infected with HIV concluded that breastfeeding significantly reduced mortality among their children and was not associated with increased morbidity or mortality among the women (Taha et al., 2006).

Breastfeeding is also provides a number of social, psychological, family spacing and economic benefits to both mother and baby. These advantages remain even in better off urban settings. Studies from urban settings in other middle income countries such as Brazil (Victora et al., 1996) and Malaysia (Habicht et al., 1996) have found that breastfeeding provides a great deal of protection against infection and mortality of young children. Studies from Europe and the United States have found that even in very well resourced settings infants who are breastfed are less likely to have common infections such as ear infections and show better cognitive and motor development than infants who have not been breastfed.

It is important to stress that there is a dose response relationship between the amount of breastfeeding and the benefits. So exclusive breastfeeding (i.e. giving no other fluids or solids, not even water) has a significantly greater impact than mixed feeding. However, in some settings in South Africa, especially in hospitals, it is common practice to give babies other substances to drink within the first days of life. Finally results from a recent large study in Ghana found that late initiation (after day 1) of breastfeeding was associated with a 2.4-fold increase in risk of neonatal death. The authors calculate that 16 percent of neonatal deaths could be saved if all infants were breastfed from day 1 and 22 percent if breastfeeding started within the first hour (Edmond *et al*., 2006).

Comparison of findings from the 1998 and 2003 South African DHS surveys shows:

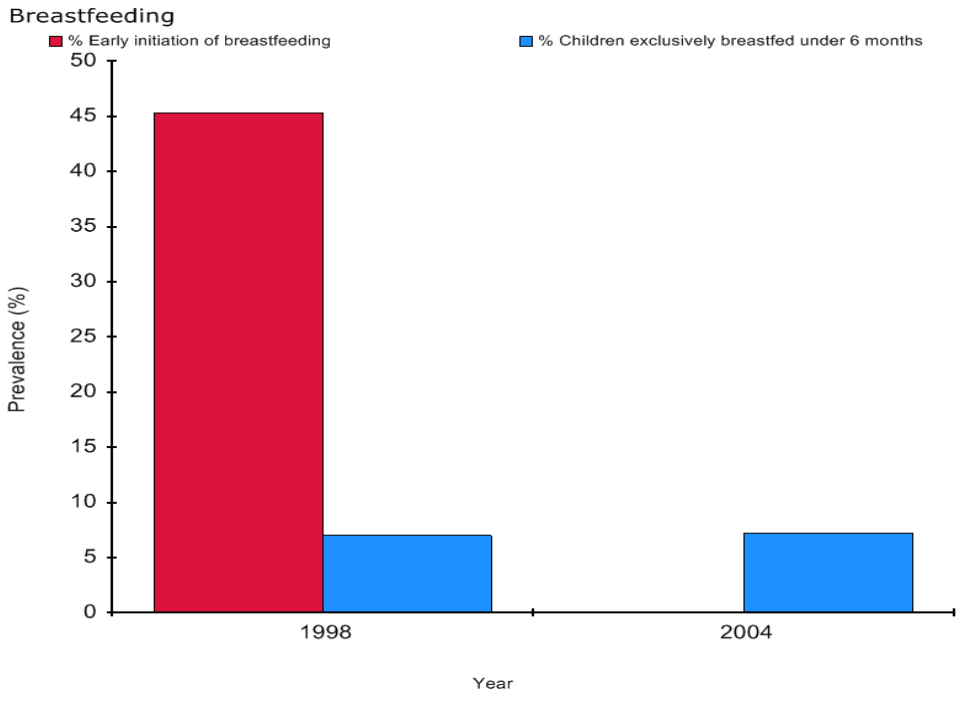
- South Africa has made no progress on promoting exclusive breastfeeding between 1998 and 2003 as shown in Figure 5. With less than 10% of infants under 6 months being exclusively breastfed.

- In 2003 the majority of babies (82 percent) are breastfed for at least some period but 39% mothers did not initiate breastfeeding within one hour of birth. Newborns in two of the provinces with the highest infant mortality - Mpumulanga and KwaZulu-Natal - are the least likely to be breastfed soon after birth (53 and 46 percent respectively), while those in Western Cape are the most likely (69 percent).

- The proportion of mothers with no education not giving breastmilk to their babies increased from 9 percent in 1998 to 26 percent in 2003. This is a worrying trend especially as infant deaths are more likely amongst this group. There is now a reversal in the gradient of breastfeeding and education with the most highly educated category now having a higher proportion of ever breastfeeding than most of the lower categories.

- A significant minority (29 percent) of babies were given a prelacteal feed and seems to particularly prevalent in the Eastern Cape, KwaZulu-Natal, Gauteng and Limpopo where 30 percent or more of babies were given a prelacteal feed.

Figure 5. South Africa's breastfeeding practices 1998 -2004



Poor infant and young child feeding practices

It is well known and documented that in South Africa the vast majority of infants receive foods other than breast milk by age 4 months. [24, 15, 16] Usually the main reasons given for the early introduction of complimentary foods relate to the mother's perception of the adequacy and quality of her breast milk. It is also known that cereals, maize and wheat based are the most common first foods to be introduced often added to the feeding bottles of infants as early as 2-3 months of age. [17]

Current evidence is conclusive regarding 6 months of age as the appropriate age for the introduction of complimentary foods. Energy and nutrient dense semi-solid pureed foods which are easily digestible and readily metabolized are recommended as suitable complimentary foods. According to the 1999 NFCS, dietary intake in most children were confined to a relatively narrow range of foods, of low micronutrient density, and with variable reported energy intakes, which were particularly inadequate in rural areas. Steyn et al, 2006 presented selected NFCS data in comparison with recommended nutrient intake (RNI) values which showed that energy intakes were inadequate for rural children and while protein and macronutrient requirements were met, inadequate intakes were reported for vitamins A, C, niacin, vitamin B_6, folate, calcium, iron and zinc. This data supported the high rate of stunting and underweight found in these children and suggest that optimal growth and immune status are compromised.

Nutritional Impacts of HIV/AIDS

There are a number of ways that HIV/AIDS is contributing to the poor nutritional status of many South Africans. The broader impact on food security has been discussed earlier. In this section we briefly summarise the direct impact of the infection on nutritional status and the indirect impact on infant feeding.

According to the World Health Organisation, individuals living with HIV (PLHIV) who are asymptomatic need to increase their energy intake by 10 percent while symptomatic individuals should increase their intake by 20-30 percent (WHO 2003). People on antiretroviral (ARV) treatment in resource poor settings may lack access to sufficient quantity and quality of food to complement their treatment, offset side effects, and encourage adherence. Current research indicates that good nutrition is as important to the efficacy of medical interventions as it is to peoples' ability to resist and mitigate infection. Castleman et al (2004) highlight the importance of all PLHIV maintaining adequate food consumption and nutrition levels regardless of whether they are taking ARV treatment. Research has also shown that independent of ARV treatment, weight loss remains a predictor of mortality in HIV-infected individuals (Tang et al. 2002; Mangili et al. 2006). There is now clear evidence that

[15] Steyn, N.P., Badenhorst, C.j., Nel, J.H., Ladzani, R. (1993). Breastfeeding and weaning practices of Pedi mothers and the dietary intakes of their pre-school children. South African Jornal of Food Science and Nutrition 5, 10-13

[16] Faber, M., Oelofse, A., Kriek, J.A., Bendae A.J.S. (1997). Breastfeeding and complimentary feeding practices in a low socio-economic urban and a low socio-economic urban area. South African Journal of Food Science and Nutrition 9, 43 -51

[17] Bourne, L.T., Marais, D., Love, P. (2007). The process followed in the development of the paediatric food-based dietary guidelines for South Africa. Maternal and Child Nutrition, 3. 239-250

malnourished individuals starting ARV therapy are far more likely to die (by an estimated six times) in a given period than well-nourished individuals (Paton et al 2006).

With regard to ARVs, given the likely difficulties for large numbers of people meeting and sustaining drug adherence thresholds of greater than 95%, there is a significant likelihood that viral resistance will develop and spread, undermining the efficacy of existing drug regimes. A whole new and very expensive second-line drug regime may soon be required to respond to such resistance. Side effects are one reason for such poor adherence and there is evidence that malnutrition makes such side effects worse. This further strengthens the case for improving understanding of how to mainstream nutritional support into HIV responses. Nutritional support of asymptomatic HIV-positive individuals may delay the need for ARVs, though more research is needed here. However ,there is also a large literature from TB control programmes that supports the important role that nutritional interventions can play in improving the efficiency of infectious disease control programmes.

The transmission of HIV through breast milk has provided significant scientific and programmatic challenges to programmes aimed at preventing mother-to-child transmission (PMTCT) and to maternal and child health programmes. Antiretroviral therapy alone during labour and delivery can reduce the MTCT risk to about 15 per cent at three months in breastfeeding infants. Combination therapy (zidovudine and lamivudine during the last eight weeks of pregnancy, plus a single dose of nevirapine during labour and delivery) has been shown to reduce mother-to-child transmission rates to under 6 per cent at six weeks in breastfeeding infants (Lallemant et al. 2000).

The rate of HIV infection in breastfed infants is cumulative and increases with duration of breastfeeding; the estimated cumulative probability of transmission (with ARV prophylaxis at birth) between 4 weeks and 18 months of age was 9.3 per cent according to an individual patient meta-analysis. Furthermore, approximately 42 per cent of all HIV infections in infants were attributable to breastfeeding (BHITS 2004). A recent study from Hlabisa, South Africa reported sharply reduced rates of HIV transmission in exclusively breastfed infants.

The South African PMTCT programme provides free breastmilk substitutes for those infants who fulfil certain criteria related to the safety and feasibility of not breastfeeding. However evaluations of the programme have found very poor quality counselling and assessments of HIV exposed infants. For example, one evaluation found poor infant feeding counselling showing that two-thirds of HIV-positive mothers made inappropriate infant feeding choices, resulting in a three-fold increased risk of their infant becoming infected with HIV or dying. A CDC evaluation of one of severest diarrhoea epidemics in Botswana reported that all but one of the many deaths were amongst infants who were part of the national PMTCT programme and were receiving breastmilk substitutes.

Current nutrition interventions

The South African Integrated Nutrition Programme (INP) targets nutritionally vulnerable communities, groups and individuals with children under fives of age; at-risk pregnant and lactating women; persons suffering from lifestyle-related and chronic diseases and at-risk elderly and disabled persons. There are several programmes in nutrition and child health in the public sector in South Africa that are linked to health facility-based nutrition interventions at the primary level of care. Besides the INP, nutrition recommendations and counselling is provided through IMCI and the provincial Paediatric Case Management Guidelines[18]. The INP has the following main focus areas viz. (i) maternal nutrition; (ii) infant and young child feeding; (iii) youth and adolescent nutrition; (iv) micronutrient malnutrition control; (v) disease-specific nutrition support, treatment and counselling; (vi) nutrition promotion, education and advocacy; (vii) food service management; (viii) community-based interventions. The INP support systems are: nutrition information system, human resource plan and financial and administrative system.[3]

A number of reviews and assessments of the INP have taken place over the last decade[19], wherein a number of recommendations to further improve and strengthen the INP have been put forward. A major amendment to the INP, as a result of these reviews, was the shifting of the National School Feeding Programme to the Department of Education. However, aside of this not much significant has changed for the INP. As concluded by the authors of NFCS-FB-I, effective management and implementation is fundamentally crucial to the success of all the recommendations, and it should incorporate training on all aspects on which recommendations are made as well as on the monitoring and evaluation of the proposed interventions. The INP has a unique opportunity to re-assess its progress in line with these strategies in order to accelerate South Africa's progress to reduce malnutrition and meet the MDGs.

The recent Lancet Series on Maternal and Child Under-nutrition emphasized that interventions with proven effectiveness should be rapidly implemented at scale and that the period from pregnancy to 24 months of age is the crucial window of opportunity for reducing under-nutrition and its adverse effects.[14] Bryce et al (2008)[20] put forward seven key challenges for addressing under-nutrition at a national level. These included: (1) getting nutrition on the list of priorities, and keeping it there; (2) doing the right things; (3) not doing the wrong things; (4) acting at scale; (5) reaching those in need; (6) data-based decision-making; and (7) building strategic and operational capacity.

[18] Hendricks, M.K., Goeiman, H., Dhansay, A. (2008). Food-based dietary guidelines and nutrition interventions for children at primary healthcare facilities in South Africa. Maternal and Child Nutrition, 3. 251-258

[19] Labadarios, D., Steyn, N.P., Mgijima, C., Dladla, N. (2005). Review of the South African nutrition policy 1994 -2002 and targets for 2007: achievements and challenges. Nutrition 2005: 21 100-108

[20] Jennifer Bryce, J., Coitinho, D., Darnton-Hill, I., Pelletier, D., Pinstrup-Andersen, P., for the Maternal and Child Undernutrition Study Group (2008). Maternal and child undernutrition: effective action at national level. Series, Maternal and child undernutrition The Lancet 2008; 371:510-526

Prioritizing Nutrition on the development agenda

With regards to political will and prioritizing nutrition on the development agenda, South Africa is at the forefront of most developing countries by virtue of its constitutional obligations and the INP which aims to ensure optimum nutrition for all South Africans by preventing and managing malnutrition. However, given the recent NFCS-FB-I findings there is no cause for complacency. It is indeed, a cause of grave concern and it calls for immediate action especially in those areas where the prevalence of stunting exceeds 20%, namely in the rural areas. As such, the improvement of the nutritional status and health care services for young children should undoubtedly continue to be a national priority.

There is growing consensus that nutrition interventions need to conceptually and programmatically integrated; that they need to be evidence-based and based on proven impact at scale and they need to be doable action oriented interventions with clear guidance for 'who' should take 'what' action 'when'.[21] With regard to doing the right things, the INP has made some progress since 1994 however there are opportunities to improve and strengthen the interventions and improve the quality of delivering those services.

Promoting, protecting and supporting breastfeeding to achieve 80% coverage

Despite national programmes such as the Integrated Management of Childhood Illnesses (IMCI) and the Baby Friendly Hospital Initiative (BFHI) which promote, protect and support the principles of breastfeeding as contained in the Innocenti Declaration[22] and the National Infant and Young Child Feeding Policy[23] which also provides breastfeeding guidelines in the context of HIV/AIDS, South Africa has not yet achieved positive breastfeeding practices. In the South African context, the vulnerability of children to diseases of poverty is particularly high with breastmilk substitutes. Breastmilk substitutes require good conditions of hygiene and sanitation, yet a significant proportion of those mothers using breastmilk substitutes do so in environments and living conditions which are not conducive to feeding safe adequate feeds. Furthermore, Bergström, et al (2004)[24] reported in a study from South Africa that over 60% of infant formula feeds were contaminated with pathogenic bacteria, even in good conditions of hygiene and sanitation.

Despite achieving 42.5% Baby-friendly health facilities in 2008, the Department of Health acknowledges the poor breastfeeding rates and practices in South Africa, citing behaviour change and mother support as key areas needing urgent attention[3] if the

[21] Sanghvi, T, and J Murray. 1997. "Improving Child Health Through Nutrition: The Nutrition Minimum Package." Arlington, VA: Basic Support for Institutionalizing Child Survival (BASICS) Project, for the U.S. Agency for International Development.
[22] UNICEF/WHO (2005) Innocenti Declaration on the Promotion, Protection and Support of Breastfeeding based on the WHO/UNICEF Policymakers Meeting on Breastfeeding in the 1990s' www.unicef.org/nutrition/index_24807.html
[23] Department of Health (2006). Infant and Young Child Feeding Policy. Department of Health: Pretoria
[24] Bergström, E., Rollins, N., Sturm, A.W., & Greiner, T. (2004). Bacterial contamination and nutrient concentration in infant milk in South Africa: A sub-study of the national prevention of mother to child transmission cohort study. International

country is to reap the benefits of a large scale successful breastfeeding programme such as demonstrated in Boliva and Ethiopia[25]. The benefits include amongst others decreased infant morbidity and mortality. South Africa, as a member of the World Health Assembly (WHA) and a signatory to the United Nations Convention on the Rights of the Child is bound by these resolutions which include the International Code of Marketing of Breast Milk Substitutes.[26] While it is expected and well documented that breastfeeding decreases with urbanization a significant proportion of children underage 6 months are reportedly mixed fed in rural areas and a very low proportion of children are continued to be breastfed at age 2 years. [27]

In South Africa, breastfeeding activities were largely limited to the promotion of the 'breast is best' message through health education and the yearly observation of 'breastfeeding week'. Considerable barriers to breastfeeding existed in birthing facilities, health professionals and the wider community. It is only recently that measures to support and protect breastfeeding through broader health-promoting activities aimed at overcoming these barriers have been prioritized and actively undertaken through the initiatives of the DOH.[19, 26] In addition, any attempts that were previously made at promoting breastfeeding had to compete against the unethical marketing and promotion of breastmilk substitutes by major multinational companies. Despite adopting the Code of Ethics for the Marketing of Breastmilk Substitutes, South Africa has no legislation relating to the enforcement and monitoring of code compliance Changes in cultural and traditional nutrition and infant feeding practices have also been compounded by rapid urbanization. Further degradation of breastfeeding has been with the discouragement of breastfeeding as a means of reducing mother-to-child transmission of HIV through breastmilk.[28]

Using evidence-based interventions[29] and a proven community based approach, derived directly from programmatic field experience[30] has provided experience and guidance on key activities amongst others to promote, protect and support breastfeeding. Researchers in KwaZulu Natal, in the context of the PMTCT, have impressively shown an improvement of EBF rates to over 70% where appropriate support strategies have being implemented.[31] These include: Reorienting health services by removing barriers to breastfeeding in birthing facilities, providing skills training for service providers and the BFHI in the public sector. However, very little has being done to engage non-public sector stakeholders to promote, protect and support breastfeeding as has successfully being achieved with the fight against HIV/AIDS. As in all social marketing strategies and programme implementation a strong community ownership is imperative for going to scale and for sustainability.

[25] www.aed.org/linkages
[26] WHO (2003). Global Strategy for Infant and Young Child Feeding. World Health Organization: geneva
[27] Smuts, C.M., et al. (2008). Socio-demographic profiles and anthropometric status of 0-71-month old children and their caregivers in rural districts of the Eastern Cape and KwaZulu-Natal provinces of South Africa. *South African Journal of Clinical Nutrition, 21(3). 117-124*
[28] Latham, M. (2001). Breastfeeding and HIV – A four country study. Presented at the 17th International Congress of Nutrition. August 27-31, 2001. Abstract [3.03.012]
[29] V.Quinn (2003). Essential Nutrition Actions. www.pro**nutrition**.org/archive/200305/
[30] Mason, J (2000). "How Nutrition Improves and What that Implies for Policy decisions". Paper prepared for the World Bank-UNICEF Nutrition Assessment. www.tulane.edu/~internut/publications/
[31] Department of Health (2003). Prevention of Mother-to Child Transmission of HIV –Infant Feeding Policy. Provincial Administration of the Western Cape: Cape Town

The effort to reach 80% of all mothers to successfully EBF for 6 months needs an innovative and creative approach if South Africa is to enjoy the many benefits exclusive breastfeeding offers.

Improving infant and young child feeding practices

A recent systematic review of interventions to improve complementary feeding came to the following conclusion:

" carefully designed programmes that include pre-tested educational messages provided through multiple channels, with fortified foods or home-fortification products made available depending on the needs of the target population, can substantially improve growth and micronutrient status and may also reduce morbidity and enhance behavioural development" (Dewey et al 2008)

South Africa like many other developing countries is experiencing the double burden of disease where under- and over-nutrition coexists. Therefore a careful balance should be achieved in any national public health message. The South African paediatric food-based dietary guidelines for children younger than 7 years is a set of consumer tested health messages which strives to facilitate the education of care-givers of young children to adopt healthy eating practices. The guidelines address issues regarding variety in the diet that has shown to improve both macro- and micronutrient intakes. Specific reference has being made to plant-based high fibre and low fat food sources. Non-food-based guidelines are also included, which recognize the importance of active play, for development and health, development stages and regular attendance at health clinics.

A number of recent reports indicate that international and local interest in infant and young child nutrition (IYCN) is increasing.[11, 14, 38, 42,] There is due recognition by government, academics and other stakeholders of the importance and the urgency of addressing this problem. In this regard, the environment for improved feeding is supportive, and family finances are available for purchasing affordable products. However, weaknesses exist with regard to knowledge among health workers and communities about best practices and conflicting information abounds. All factors highlighting the need for an intensive and extensive social marketing programme for optimal child feeding practices. While enriched commercial complementary foods are widely distributed through existing commercial channels and used, even in the most rural areas, they are often not used in sufficient quantities, or are used inappropriately. More importantly these enriched complementary feeding products do not reach those households and communities who need them most i.e. the lower socio-economic strata of the population and those in geographically hard-to-reach areas.

While, the government has an IYCN policy and regulations have been drafted for the marketing of breastmilk substitutes and foods for infants and young children, the Department of Health recognizes the need for collective action with private sector to reach those in need and to build sustainable programmes. The potential exists for wider use of these enriched complementary feeding products, with appropriate marketing this will also improve breastfeeding and young child feeding practices. The authors of the NFCS and the NFCS-FB-I highlighted the need for a stakeholder forum to improve communication among stakeholders, ensure that work is not

duplicated, improve the planning of work so as to prevent duplication and overall improve the success of all attempts to improve the nutritional status of South African infants and young children.

Infant and Young Child Feeding Policy Recommendations

- **Develop and implement a large scale breastfeeding social marketing or communication strategy**
- **Implement legislation of the WHO Code of Ethics for the Marketing of Breastmilk Substitutes and strengthen the monitoring of Code compliance in South Africa**
- **Establish a Department of Health facilitated IYCF multi-sectoral forum**
- **Develop and implement a large scale IYCF social marketing or communication strategy for children 6-24months in line with the Paediatric Food Based Dietary Guidelines**
- **Support the development, marketing and distribution of an affordable enriched complementary food product**
- **Update training of health workers on breastfeeding and complementary feeding counselling**

Micronutrient Control Programs

Vitamin A Programmes
The 1999 NFCS highlighted the main micronutrient deficiencies of public health significance among infants and young children in South Africa as vitamin A, iodine, iron and zinc. The 2005 NFCS-FB-I reconfirmed vitamin A, iron and zinc deficiencies. In response to the poor vitamin A status of South African pre-schoolers, in 2002 the Department of Health initiated preventative high-dose vitamin A supplementation to women in their post-partum period (within 6-8 weeks after delivery) and to children 6 -60 months. Treatment doses were also provided to children who suffer from severe malnutrition, measles, persistent diarrhoea, and xeropthalmia.[32] The 2003 SADHS found that less than 40 percent of children were reported to have received vitamin A supplement in the last 6 months. The Eastern Cape scored the best with 58 percent of children receiving supplementation. In contrast, just under 30 percent of children in the Western Cape were reported as having received a supplement in the previous 6 months.

Iron deficiency Control programs
Internationally, effective strategies to address the world's most common mirconutrient deficiency, iron-deficiency anaemia has being elusive. However, a number of new innovations have proven very positive which include iron-folate twice weekly dosing of adolescents and women-of child bearing age, the use of in-home fortification with multiple micronutrient powders and in controlled trails consumption of iron fortified

[32] Department of Health (2002). Information for Health Workers on Vitamin A Supplementation. Department of Health: Pretoria

foods.[33] In relation to the latter, van Stuijvenberg, et al 2008 reported that electrolytic iron at the level currently used in South Africa is not effective in improving iron or haemoglobin status and that the current international fortification level be considered which is twice the current South African level. The researcher further reported that sodium iron-EDTA (NaFeEDTA) nor ferrous fumarate appeared to be suitable alternatives for the fortification of wheat flour, when included at levels that do not cause colour changes. Higher fortification levels cause colour changes which are unacceptable to the milling and baking industry[34]

Zinc deficiency

The findings of this first national survey of serum zinc levels in children 1-9 years old clearly indicate that zinc deficiency is a problem in this age group. The higher prevalence of zinc deficiency in the younger age group 1-3 years may reflect the poor dietary choices and feeding practices. Zinc fortification may not entirely address zinc deficiency problem therefore other options such as supplementation and food diversification need to be considered. In the international literature, there are still unresolved questions, as for the instance of the role of zinc supplementation in public health policy to improve mortality, morbidity, growth and development in young children. Studies from Asia have shown positive result but results from Africa have been inconsistent.[35] Despite this, the INP should strongly advocate and engage IMCI and other child health services to scale up the use of zinc in conjunction with Oral Rehydration Solution (ORS) which has being proven to significantly decrease the incidence and severity of diarrhoea.

In April 2003, mandatory food fortification legislation was enacted and in October of the same year, the food fortification programme using maize, wheat and wheat flour was implemented to address the micronutrient needs of children. However, in light of the current findings[24,36] much still needs to be done to support optimal (quality and quantity) and appropriately timed complementary feeding amongst South African mothers. Within the context of the positive findings of the knowledge, attitude and behaviour on food fortification and nutrition[37] educational messages and a context-specific social marketing communication campaign to improve complementary feeding practices would be timely and appropriate for the already motivated market.

[33] Micronutrient Forum (2007) www.micronutrientforum.org

[34] van Stuijvenberg, M.E., Smuts, C.M., Lombard, C.J., Dhansay, M.A (2008). Comparison of the efficacy of NaFeEDTA, ferrous fumarate and electrolytic iron as fortificants in South African brown bread. 2008 Nutrition Congress Evidence based Nutrition leading the way 28 September – 2 October 2008. Abstract 6

[35] Sazawal, S., et al (2007). Effect of zinc supplementation on mortality in children aged 1-48 months: a community-based randomised placebo-controlled trial. Lancet 369, 927-934

[36] MacDougall, G.C., MacIntyre, U.E., Labadarios, D. (2008). Prevention of mother-to-child transmission (PMTCT) programme at Dr George Mukhari Hopsital (DGMH): Growth of Infants. Abstract 37. 2008 Nutrition Congress: Evidence based Nutrition leading the Way in Innovation. 28 September – 2 October 2008. Pretoria, South Africa

[37] Gericke, G.J., Labadarios, D., Ntsie, P.R. (2008). Knowledge attitude and behaviour (KAB) on food fortification of women of child bearing age (NFCS-FB-I). Abstract 71. 2008 Nutrition Congress: Evidence based Nutrition leading the Way in Innovation. 28 September – 2 October 2008. Pretoria, South Africa

Micronutrient Control Programme Policy Recommendations

- **Review of the micronutrient fortification levels of the current food vehicles in light of the poor micronutrient status of children especially vitamin A and iron**
- **Strengthen standards compliance monitoring systems for fortified foods**
- **Explore the option of promoting two Vitamin A months six months apart for children 12-59 months through a social marketing or communication strategy**
- **Implement iron sulphate supplements for children 6-24 months**
- **Explore options for improving availability of fortified foods for young children for example by home fortification with multiple micronutrient powders for children 6 -24 months**
- **Advocate and strengthen the use of WHO/UNICEF protocol of zinc with ORS in the management of diarrhoea**
- **Implement a food diversification communication or social marketing strategy in line with the Paediatric Food Based Dietary Guidelines**

HIV/AIDS and food security

In the face of the challenges posed by the HIV-hunger nexus, there is no convenient magic bullet intervention and no blueprint. A truly multi-sectoral involvement is required. This is fundamentally different to simply adding more (usually vertical) HIV activities on to sectoral plans. Mainstreaming starts with decisionmakers internalizing AIDS as a development issue, leading in turn to a critical review of existing policies and programmes through the lens of their growing knowledge of AIDS interactions. It is a process involving continual reflection, and the progressive application of principles and processes for responding -- rather than pulling pre-designed interventions off the shelf.

Food and nutritional assistance

Most nutrition-relevant research in the context of AIDS is clinical research that relates primarily to interactions within the individual body and their implications for health policy. There is currently a strong focus on *clinical* nutrition and HIV in the context of issues such as infant feeding, mother-to-child-transmission and the safety and efficacy of ARV therapy among malnourished populations (WHO 2005). There have been few corresponding attempts to link nutritionists with agricultural economists or program managers to investigate the broader issue of household and community-level nutrition security, policy and programming in the context of AIDS. Work is needed to clarify ways of bridging the gap between short-term nutritional support to individuals and longer term livelihood security programming for communities affected by AIDS. Such interdisciplinary research will need to be matched by inter-sectoral action on the part of the agriculture and health sectors in such environments. A focus on nutrition *security* – through ensuring the food, health and care preconditions for long-term nutritional wellbeing -- can help reveal opportunities for effectively linking health services with agriculture, food and nutrition policy in the context of HIV and AIDS.

Most nutrition-relevant responses to date have revolved around delivery of food aid. Food assistance remains a widely employed safety net in the context of HIV and AIDS, despite a paucity of evaluations of impact on HIV related target groups (Strasser et al 2005). Key areas of expected effect include increases in daily food consumption by all household members, in money available for other needs, and an overall increase in household food security. These key effects should in turn generate a cascade of secondary effects measurable by indicators such as anthropometrics, treatment adherence, school attendance, productivity, and the degree of reliance on risky response strategies and on caregivers. Food aid targeting design however tends to be oriented by certain types of people rather than the determinants of vulnerability, and this may lead to significant inefficiencies. Not all female-headed households for example are vulnerable, nor are all orphan-fostering households. Drimie and Mullins (2005) discuss ways in which a livelihoods approach can guide analysis to go further, to a better understanding of who is actually at risk or vulnerable, why, and how to improve their resilience. Where food assistance is required, there is an emerging consensus on the need for multiple criteria to target beneficiaries. Useful criteria include the presence of a chronically ill adult, high dependency ratios (including the number of orphans). Analyzing Community Health Surveillance data, Strasser et al (2005) suggest targeting efficiency could be improved by first differentiating households according to wealth category (using, for example, assets as a proxy) and then applying other criteria such as chronic illness.

Not doing the wrong things

A principle of life is that in doing one thing you forfeit the opportunity to do something else –better understood as opportunity costs. Therefore, it is in the interest of progress to focus on high impact interventions which is not always the case for the many current programmes that are part of the INP which have not been as successful as hoped. The Lancet series clearly states that nutrition resources should not be used to support actions unlikely to be effective in the context of country or local realities. These nutrition resources should not be used to support actions that have not been proven to have a direct effect on under-nutrition, such as stand-alone growth monitoring or school feeding programmes. In addition to health and nutrition interventions, it explicitly calls that economic and social policies addressing poverty, trade, and agriculture that have been associated with rapid improvements in nutritional status should be implemented. And that nutrition resources (country experience, expertise) need to be formalised, shared, and used as the basis for setting priorities in problem-solving research for nutrition.

Growth Monitoring & Promotion (GMP)

Growth monitoring using the growth card or Road-to-Health card (RtHC), includes regular measurement and recording of weight and promotion- the interpretation of the growth curve and appropriate counselling in line with the finding of the growth curve. In 1998, the Department of Health reported that 74.6% of children aged 12-13 months had a RtHC and that the target was to have increased this to 85% by 2007[38] however,

[38] Department of Health (2002). Integrated Nutrition Programme Strategic Plan 2002/03 to 2006/07. Department of Health: Pretoria

in the recent NFCS-FB-I only 50% of all children 1-4 years had a RtHC to verify their age and VAS. Furthermore, it is to be noted that currently GMP is based on weight-for-age measurements and therefore, anthropometric disorders diagnosed by employing length/height measurements cannot be determined within the current system of growth monitoring. As such, stunted or overweight/obese children cannot be identified and targeted for appropriate intervention and counselling. Hence, the recommendation from the authors of the NFCS-FB-I that health professionals involved in GMP should be trained to measure length of children older than 6 months.

Besides the effort of training health professionals to correctly and accurately take anthropometric measurements; there is the cost to appropriately equip and maintain or replace anthropometric equipment; and to effectively and efficiently feed this data into a nutritional surveillance system, for GMP to have a high cost benefit. All these requirements seem too costly in time, effort and finances to be a cost-effective intervention to addressing malnutrition. Many countries have since abandoned GMP and have focused on promoting essential nutrition actions.[36, 38] In Bangladesh, despite the negative critique[39] regarding growth monitoring programs it was found that the coordination of growth monitoring with the delivery of antenatal and immunization services had indeed improved coverage of these other activities far greater in Bangladesh Integrated Nutrition Programme intervention areas than elsewhere.[40] Also, there were benefits to some target groups, especially those from poorer households who otherwise would not have been reached.

Food Supplementation/Protein Energy Malnutrition Scheme (PEM).

In the INP component, disease-specific nutrition support, treatment and counselling, children with under-nutriiton are managed by the Health Facility-Based Nutrition Programme (HFBNP), which contains a package of nutrition interventions that are implemented as part of the primary health care (PHC) package at PHC facilities. Besides growth faltering and underweight in children, the PEM scheme is also implemented to address chronic energy deficiency in pregnant and lactating women, patients with HIV/AIDS, TB and other debilitating conditions. In conjunction with the food supplementation, dietary counselling and nutrition education is also provided.

With the advent of ready to use therapeutic foods (RUTF) and community management of severe acute malnutrition[41] which allows the management in the community of large numbers of children who are severely malnourished without medical complications, South Africa with its low prevalence of child wasting, an large numbers of HIV-infected patients may use the opportunity to explore the implementation of using RUTF in community-based settings in the context of

[39] Hossain SM, Duffield A, Taylor A. 2005. An evaluation of the impact of a US$60 million nutrition programme in Bangladesh**.** *Health Policy and Planning* **20**: 35–40.
[40] World Bank. 2005b. Bangladesh Integrated Nutrition Project: Project Performance Assessment Report. Report No. 32563. Washington, DC: World Bank.
[41] World Health Organization/World Food Programme/United Nations System Standing Committee on Nutrition and the United Nations Children's Fund (2005). Community-based management of severe acute malnutrition. www.who.org

HIV/AIDS. These guidelines for the management of severe malnutrition have being successfully adapted by other countries such as Malawi and Niger[42].

Nutrition Education & Promotion

In the INP, nutrition education and promotion has essentially being limited to one-on-one counseling and awareness building activities through the health facility. In the context of social marketing and effective information, education and communication (IEC) strategies, the Department of Health has a poor track record of health education programmes and behaviour change communication. Except for the national food fortification programme, very little has being done to engage non-public sector stakeholders to successfully and effectively implement a social marketing campaign for improved dietary practices as has so successfully being achieved with the fight against HIV/AIDS. Effective programmes and policies to address malnutrition throughout the life course should include not only health promotion and education but community empowerment and action to overcome the environmental, social, and economic constraints to improving dietary quality and maintaining a physically active life. Immediate action to control and prevent nutrition-related diseases from conception throughout the life course is not only a public health imperative but also a political, economic, and social necessity.

Stunting in children and Body Mass Index (BMI) in adults is the true litmus test for any nutrition program. Among the reasons for the low impact on nutrition outcome indicators such as growth (stunting) or dietary practices (food diversity), according to the literature was the strong focus on Behaviour Change Communication (BCC) targeted nutritional education at mothers, but as is well known, and quantified in a number of studies, mothers are rarely the sole decision-makers regarding child health and nutrition. Husbands and mothers-in-law play an important part. Hence, social pressures may prevent the adoption of different practices. Finally, women are constrained from putting knowledge into practice by time or resource constraints and unless there is an enabling environment with the appropriate support and follow up, action and in turn positive change is unlikely.[41, 43]

Acting at scale

It is well documented that in the current National Nutrition Program (NNP) in Bangladesh and it's predecessor the Bangladesh Integrated Nutrition Program (BINP), the world's largest and most costly community-based nutrition program there has being a knowledge-practice gap[44, 45]. The most agreed and cited flaw of these two nutrition projects was the oversight and costly decisions to ignore lessons learnt from the pilot projects and not to have allowed these projects to emerge at district and local levels. This underscores the need to find the balance in the trade-off between scale and standardization (inflexible program packages) versus diversity and local context-specificity. A number of NGOs have embraced and entrenched the learning-by-doing

[42] www.unicef.org/nutrition
[43] White H. (2005). The Impact of the Bangladesh Integrated Nutrition Programme. Health Policy and Planning 2005 20(6):408-411;
[44] World Bank (2006). Bangladesh Integrated Nutrition Project: Effectiveness and Lessons. World Bank: Dhaka
[45] Government of Bangladesh (2008). Health, Nutrition and Population Sector Program (HNSPS) Mid-term Review Report May 2008. Government of Bangladesh: Dhaka

model in their food and nutrition programs[46,47,48] to successfully reach and work with the most vulnerable groups; both geographically and with respect to women and children under five.

From the findings of the NFCS-FB-I, South Africa has a few priority targets with respect to settings viz. the rural, the informal urban and priority provinces. In this respect, the INP through the provincial Nutrition Directorates in partnership with non-public sector stakeholders should set the nutrition agenda and plan, develop and implement nutrition interventions which are need-based and responsive to the local context including the nutrition research agenda and health professional training and competencies. It is in collective action that more can be achieved. In this light, private-public partnerships are imperative if we are to find scaleable solutions as the challenges of malnutrition are too complex for any one sector to solve unilaterally[49].

Reaching those in need

Because health resources are limited, it is essential that they are used effectively and efficiently. The use of evidence and data for monitoring and evaluation is critical to achieve maximum effectiveness. Such an approach is now being reinforced with the move towards results and outcomes based measurement of performance, rather than just inputs and processes. Another important factor is the recent shift towards evidence-based policy-making. Inefficiencies in the health delivery system are costly to those who need it most and inexcusable at a programme management level, given the recent wealth of information on proven interventions to address malnutrition. Mis-targeting is an expensive opportunity cost and misappropriation of effort. All these factors can be found in the current INP. It is therefore imperative for any programme to have a strong monitoring and evaluation system.

By applying the Triple A approach of Assess, Analyze and Action all stakeholders involved in the programme are able to use the information and data generated to make and effect changes to address the problem that has being identified. This can take place at the community level, the service delivery point or at a program management level. While routine project monitoring and tweaking will assist in delivering an effective program, it is always wise to undertake a third party baseline, mid-term and endline survey together with nutrition surveillance. Through an institutionalized structured supervisory system, program monitoring data can feed into a central data base where service data and information for the activities, the geographical area and coverage is easily collected, essentially feeding into an established Health Management Information System.

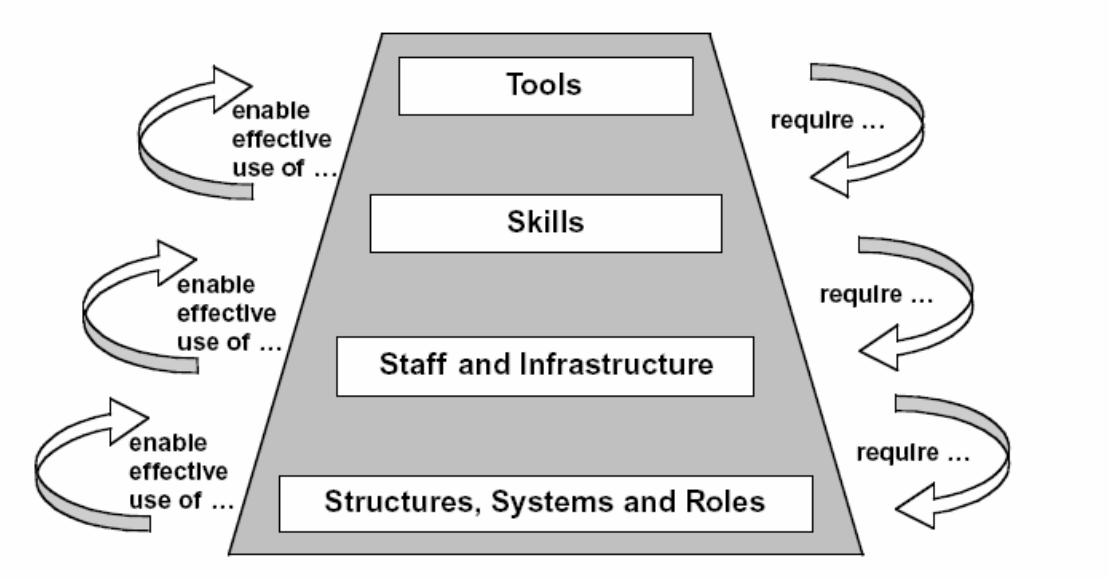
[46] HKI/Asia Pacific (2003). Strengthening the capacity of local NGOs through food production and nutrition programs in Bangladesh, Cambodia and Nepal. Special Issue: June 2003. HKI: Dhaka
[47] Save-the-Children-US (2007). Mid-Term Evaluation. The Fiscal Year 2005-2009 Development Assistance Program "Jibon o Jibika. Save the Children USA: Dhaka
[48] HKI/IPHN (2003). Life in the Chars in Bangladesh – Improving nutrition and supporting livelihoods through homestead food production. Bulletin No.14. HKI: Dhaka
[49] Nelson, J. (2006). Business as a partner in Overcoming Malnutrition – An Agenda for Action. The Clinton Global Initiative.

Building strategic and operational capacity

Human Resources

As illustrated in the figure below by Potter and Brough[50], skills are essential for staff to be effective and efficient for the work at hand. This was also highlighted in the recent NFCS-FB-I which concluded that when policies fail they appear to do so because of constraints primarily of the human resource type.

Figure 6. Schematic diagram for effective program management



Structures, systems and clear roles and responsibilities are fundamental to implementing a successful program. As pointed out by Mason (2000), weak coordination, program monitoring and integrated health information systems all contribute to poor performance. Appropriately trained and skilled human resources are a serious challenge to many development programs across the globe. More so, for marginalized and underserved regions like the rural areas, where lack of human resources is the number one sited challenge for both government and the non-governmental sector. Some serious thought must be put into human resource development in terms of recruitment, training, placements and retention of skilled motivated staff. In successful nutrition programs, community-based frontline staff is the backbone of an effective integrated health and nutrition program.[51] Given the diversity in culture and language, it would be appropriate to make special investments in developing and fast-tracking training of frontline staff to serve rural communities. The ratio of households (hh) per community-based health worker should strongly consider a ratio of 100-150 hh per community-based health worker as described in international nutrition programs. In settings with low population density and/or a wide

[50] Potter, C and Brough, R. (2004). Systemic capacity building: A hierarchy of needs. Health Policy and Planning, 19(5): 336-345. London: Oxford University Press

[51] Mason, JB (2000). "How Nutrition Improves and What that Implies for Policy decisions". Paper prepared for the World Bank-UNICEF Nutrition Assessment. www.tulane.edu/~internut/publications/

geographical spread of the population it would be reasonable to half the hh ratio per frontline community health worker to 50-60 within a 2km radius.[52]

Staff motivation and dedication are influenced by a number of factors among others remuneration and incentives. At present there is a wide difference between the qualifications, workload, level of competencies needed and remuneration packages among the government, UN and NGO frontline workers. Routine and systematic monitoring and direct supervision is essential for both quality assurance and staff motivation. Performance-based monitoring with a built-in reward or staff recognition system has proven to be effective. Logistical support and infrastructure also determines the effectiveness and efficiency of the work force, e.g functional and appropriate equipment for growth monitoring, attractive and culture or context-specific communication materials.[53]

Building Strategic and Operational Capacity Policy Recommendations

Human Resources

- **Establish a Department of Health facilitated Task Group to undertake the assessment of the human resource requirements to effectively strengthen, expand and implement the INP to address current and urgent issues**
- **Undertake as a matter of urgency a national audit of dedicated and supporting nutrition personnel in the country**
- **Develop and implement a human resource strategy for Nutrition in the public health sector**

Nutrition Information Systems

The need for comprehensive, flexible information systems, to track global and country-specific goals and targets is evident and well-recognized. Food and nutrition security surveillance systems have contributed to greater understanding of the interdependence of the various causes of under-nutrition and, they have supported governments as well as the international community with hard data on key health, nutrition and development issues as well as contribute to policy dialogue and policy formulation. [54] A robust health information system is a core component of good governance. However the data required to make effective decisions, especially regarding child health and nutrition, are not confined to the health sector.

South Africa has invested heavily in strengthening health facility based health information systems. However these systems are not yet consistently producing

[52] Sanghvi, T, and J Murray. 1997. "Improving Child Health Through Nutrition: The Nutrition Minimum Package." Arlington, VA: Basic Support for Institutionalizing Child Survival (BASICS) Project, for the U.S. Agency for International Development.
[53] World Health Organization (2006). World Health report 2006: Working together for Health. WHO:Geneva
[54] Martin W. Bloem, Regina Moench-Pfanner, Dora Panagides (Eds.). *Health & Nutritional Surveillance for Development.* Singapore: Helen Keller Worldwide, 2003.

reliable data. For many of the critical core indicators, health facility based data are not sufficient and population based data are required. Population-based health information sources include the census, vital events monitoring including cause of death statistics, and population-based (usually household) surveys and surveillance. Generally, the population based information systems need substantial development. In addition to the national cause of death statistics and the census, at a national level, there are several household surveys emanating both from the health sector (SADHS, HIV surveys, food consumption and nutrition national surveys etc.) and outside the health sector (General Household Survey, Labour Force Survey etc.). In addition, there are three demographic surveillance sites and some panel studies. These data sources do not yet provide comprehensive information on the health status in South Africa. This results in major gaps in the health information needed for evidence-based decision making. The existing data sources are not standardised in terms of the way they are collected, making comparison difficult.

A number of recommendations have being put forward by the NFCS-FB-I consortium to assist the National Directorate: Nutrition to establish an effective Food and Nutrition Surveillance system which will collect population-based data, interpret and disseminate nutrition information which will be responsive and relevant to decision-making for effective programme implementation.[9] While the need of such a system is undisputed, given the complexities of the South African context, it is imperative that a multi-sectoral interdisciplinary team build consensus on the development of such a system.

Building Strategic and Operational Capacity Policy Recommendations
Nutrition Information System

- **Convene a Department of Health facilitated a multi-sectoral multi-disciplinary panel of experts to discuss and develop a national food and nutrition security surveillance system**
- **Establish, institutionalize and implement a food and nutrition security surveillance system**

[9] Labadarios, D et al, (2008). Executive summary of the National Food Consumption Survey Fortification Baseline (NFCS-FB-I) South Africa, 2005. South African Journal of Clinical Nutrition, 2008; 21(3) (Suppl 2): 245-300

- **Table 4. Proposed Health Activities and Critical Contact Points for Maternal & Child Health[55] Service Delivery (Adapted from the Linkages Project)[56]**

Adolescent Girl	
Activity	**Contact Point**
Body Mass Index (BMI)	ADOLESCENT HEALTH FORUMS/ YOUTH FRIENDLY FACILITIES
Food Supplementation (BMI <18)	
Nutrition during growth and development	
Promotion of use of iodized salt	
Iron-Folate Supplementation	
De-worming	
Anti-malarial	
HIV/STI prevention	
Family Planning	
Gender Awareness	
Homestead Food Production (BMI <18)	
Food Assistance (in emergencies)	
Pregnant Women	
Activity	**Contact Point**
Body Mass Index (BMI)	ANTENATAL CARE
Food Supplementation (BMI <18)	
Weight gain during pregnancy	
Nutrition during pregnancy	
Danger signs during pregnancy	
Iron-Folate Supplementation	
De-worming	
Anti-malarial	
HIV/STI prevention	
Gender Awareness	
Homestead Food Production (BMI <18)	
Food Assistance (in emergencies)	
Exclusive Breastfeeding Promotion	
Post-partum Women	
Activity	**Contact Point**
Referral for pregnancy complications	DELIVERY & POSTNATAL CARE
Safe delivery	
Exclusive Breast feeding Support	
Post-partum vitamin A supplementation	
Iron/folate supplementation	
Care of the New Born	
Special care of Low Birth Weight Babies	
Body Mass Index	

[55] www.who.org
[56] www.linkagesproject.org

Food Supplementation (BMI <18)	
Diet during lactation	
Promotion of use of iodized salt	
Food Assistance (in emergencies)	
HIV/STI prevention	
Family Planning	
Gender Awareness	
Homestead Food Production (BMI <18)	

Infants 0 – 6 months	
Activity	**Contact Point**
Growth monitoring	GROWTH MONITORING & PROMOTION SESSIONS
Exclusive Breast Feeding Support	
Lactation Management	
Expanded Immunization Programme	
Care of the Sick Child	
Oral Re-hydration Solution (ORS) + Zinc	
Referral of the Sick Child	
TO THE MOTHER HIV/STI Prevention	
Family planning	

Children 6 – 59 months	
Activity	**Contact Point**
Growth monitoring	GROWTH MONITORING & PROMOTION SESSIONS
Continued Breast feeding Support (24 mo)	
Complementary Feeding (at 6 months)	
Promotion of use of iodized salt	
Supplementary Feeding (growth faltering)	
Expanded Immunization Programme	
Vitamin A Supplementation	
De-worming	
Care of the Sick Child	
Oral Re-hydration Solution (ORS) + Zinc	
Referral of the Sick Child	
Therapeutic Feeding (Wasting)	
TO THE MOTHER HIV/STI Prevention Family planning	

Table. 5 Nutrition Priorities: Current and Proposed Activities

Infant and young child feeding			
		Timeline	
Current Activities	**Proposed Activities**	**Short-term (<2yrs)**	**Long-term (>2yrs)**
Protection, promotion and support breastfeeding	Comprehensive communication strategy	x	
	Community-based ENA approach	x	
	Legislation for Article 14 of the WHO Code relating to the monitoring of code compliance in South Africa		x
	Legislation on the working conditions and maternity leave benefits for mothers (Department of Labour)		x
Baby-Friendly Hospital Initiative	Scale-up with community support & ownership		
	Extensive and intensified lactation management training for all health professionals and health workers	x	
Prevention of mother-to-child transmission	Extensive and intensified PMTCT training for all health professionals and health workers	x	
	Intensified growth monitoring of PMTCT clients		
	Optimal nutrition support for HIV-positive infants and children	x	
Early child nutrition	Comprehensive communication strategy	x	
	Community-based ENA approach	x	
	Cost-sharing commercial marketing of complementary feeding products for low income sectors	x	
Growth monitoring and promotion (GMP)	Adoption of the WHO 2006 Reference standards	x	
	Extensive and intensified training for health workers on growth monitoring and promotion	x	
	Establishment of community GMP through Community-based ENA approach	x	
	Nutrition counseling for over-weight		

Youth and Adolescent nutrition			
		Timeline	
Current Activities	**Proposed Activities**	**Short-term (<2yrs)**	**Long-term (>2yrs)**
Nutrition in schools	Weekly iron-folate supplementation girls 15-19 yrs	x	
	Nutrition and physical activities promotion	x	
	Nutrition education	x	
	Food-based strategies	x	
Eating disorders	Not priority		
Obesity	School-based approach		
Maternal nutrition			
		Timeline	
Current Activities	**Proposed Activities**	**Short-term (<2yrs)**	**Long-term (>2yrs)**
Nutrition for pregnant and lactating women	Iron-folate supplementation	x	
	Post-partum vitamin A supplementation	x	
	Comprehensive communication strategy	x	
	Community-based ENA approach	x	
Nutrition and congenital abnormalities	Not priority		
Micronutrient malnutrition control			
		Timeline	
Current Activities	**Proposed Activities**	**Short-term (<2yrs)**	**Long-term (>2yrs)**
Salt iodization	Review iodization standards in light of the virtual elimination status of South Africa	x	
	Investigate the excessive iodine status of the Northern Cape	x	
	Maintain and strengthen the salt iodization programme to reach international standard of 90% coverage		x

Micronutrient malnutrition control			
		Timeline	
Current Activities	**Proposed Activities**	**Short-term (<2yrs)**	**Long-term (>2yrs)**
Vitamin A supplementation	Improve and strengthen the VAS programme to reach international standard of 80% coverage for children 6-59 mo		x
	Improve and strengthen the post-partum VAS to reach international standard of 80% coverage in post-partum women		x
	Extensive and intensified training for health workers on VAS	x	
	Comprehensive communication strategy	x	
	Community-based ENA approach	x	
Iron deficiency control			
	Iron sulphate supplements for children 6-23 months	x	
	Weekly iron-folate supplements for adolescent girls		x
	Adequacy of iron fortification in current food vehicles		x
	Home fortification with multiple micronutrient powders		x
	Comprehensive communication strategy	x	
	Community-based ENA approach	x	
Food Fortification	Review the food fortification levels in relation to folic acid status and adequacy of iron and vitamin A		x
	Review and monitor industry compliance		x
Food & Nutrition Surveillance	Establish and institutionalize a Food & Nutritional Surveillance System in the Department of Health		x
	Periodic review and refinement of the current food and nutrition security indicators		x

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