

Strategies to reduce stunting in South Africa and the case of KwaZulu-Natal

By:

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Declaration

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Abstract

The aim of this thesis is to frame nutrition as a key driver for sustainable development. Since malnutrition, and specifically the disorder ‘stunting’, has ranging detrimental implications for development, the argument was made that optimal foetal and child nutrition and development must be rigorously pursued with collective efforts. Stunting can have both physiological and cognitive effects on an individual. The persistently high prevalence of this disorder has been a long-time feature of child health profiles in developing countries, including Sub-Saharan Africa. Hence the issue transcends the individual to include communities and national levels with a global nutrition target set to reduce stunting by 40% in children under five by 2025.

Intervention strategies aimed at the most significant window of opportunity during the first 1000 days of life (the period from conception to a child’s second birthday) should be prioritised. Nutrition specific and nutrition sensitive interventions are multi-sectoral in nature. To facilitate the success of implementation, an enabling environment (political and policy processes that shape and sustain momentum for intervention implementation), is fundamentally important.

Two sets of questions emerged from this problem statement. Firstly, developing a clear understanding of stunting magnitude and trends in South Africa, contextualised the question: which strategies are in place to reduce the prevalence of stunting? Documented strategies in the form of national policies were summarised and the approaches to stunting were highlighted. These policies are implemented in a range of sectors: The Roadmap for Nutrition, the Infant and Young Child Feeding Policy and the Strategic Plan for Maternal, Newborn, Child and Women’s Health and Nutrition are the main responsibility of the National Department of Health; the National Policy on Food and Nutrition Security is the joint effort of the National Department of Social Development and the Department of Agriculture, Forestry and Fisheries; the Draft Early Childhood Development Policy will be coordinated by the Department of Social Development and the National Development Plan, the current comprehensive national strategy, was developed by the National Planning Commission situated in the Presidency.

The second question explored the Nutrition Director’s role in reducing stunting in the Provincial Department of Health in KwaZulu-Natal. The Nutrition Programme is responsible for the development of policy and the implementation thereof in the province. Due to early indications that KwaZulu-Natal has been successfully reducing the prevalence of stunting, this individual’s leadership approach was qualitatively investigated. The key findings were that access to high-

level decision-making processes is important to programmatic success and advocacy was identified as a key method to secure commitment to reducing child undernutrition. This research responded to a call to identify nutrition leaders and describe their work - an emerging field in public health nutrition.

It is concluded that optimal nutrition is central to the creation of sustainable communities which should be adequately reflected in relevant policies and pursued by inspiring leadership.

Keywords: nutrition for sustainable development, stunting, intervention strategy, South Africa, KwaZulu-Natal

Opsomming

Die doel van hierdie tesis is om voeding aan te voer as 'n belangrike drywer vir volhoubare ontwikkeling. Aangesien wanvoeding, en spesifiek die stoornis 'dwerggroei' (*stunting*), vele nadelige gevolge vir ontwikkeling inhou, word die argument aangevoer dat optimale fetale- en kindervoeding en ontwikkeling met ywer en gesamentlike pogings nagejaag moet word. Dwerggroei kan beide 'n fisiologiese en kognitiewe effek op die individu se ontwikkeling hê. Volgehoue hoë voorkomsvlakke van dwerggroei is 'n langtermyn eienskap van die kindergesondheidsprofiel in ontwikkelende lande, insluitend sub-Sahara Afrika. Daarom lê die kwessie dieper as op 'n individuele vlak. Dit behoort aksies op gemeenskap en op nasionale vlakke in te sluit. 'n Globale teiken is gestel om teen 2025 dwerggroei se voorkomsvlakke in kinders jonger as vyf met 40% te verminder.

Ingrypingstrategieë gemik op die mees beduidende geleentheid tydens die eerste 1000 dae van 'n kind se lewe (die periode tussen verwekking en 'n kind se tweede verjaardag) moet as prioriteit beskou word. Voedingspesifieke en voedingsensitiewe intervensies is multi-sektoraal van aard. Om ingrypings se sukses te fasiliteer, is die 'ondersteunende omgewing' (politieke en beleidsprosesse wat volhoubaarheid verseker en vorm bied wanneer ingrypings geïmplimenteer word) van kardinale belang.

Twee stelle vrae het gespruit uit hierdie probleemstelling. Eerstens, om duidelike insig te ontwikkel oor die omvang en tendens van dwerggroei in Suid-Afrika, is die vraag: watter strategieë is in plek om die voorkomsvlakke van dwerggroei te verminder? gekontekstualiseer. Gedokumenteerde strategieë in die vorm van nasionale beleide is opgesom en die benadering tot dwerggroei is uitgelig. Die betrokke beleide word vanuit vele sektore geïmplimenteer: Die Padkaart vir Voeding, die Baba en Jong Kind Voedingsbeleid en die Strategiese Plan vir Moeder-, Pasgeborene-, Kinder- en Vrouegesondheid en -voeding is die hoofverantwoordelikheid van die Nasionale Departement van Gesondheid; die Nasionale Beleid oor Voedsel- en Voedingsekerheid is die gesamentlike poging van die Departement van Maatskaplike Ontwikkeling en die Departement van Landbou, Bosbou en Visserye; die voorlopige konsep vir die Jong Kind Ontwikkelingsbeleid sal deur die Departement van Maatskaplike Ontwikkeling gekoördineer word; en die Nasionale Ontwikkelingsplan, die nuutste omvattende nasionale strategie, is deur die Nasionale Beplanningskommissie vanuit die Presidensie ontwikkel.

Die tweede vraag het die rol van die Voedingsdirekteur in die Provinsiale Departement van Gesondheid in KwaZulu-Natal in die verlaging van dwerggroei ondersoek. Die ontwikkeling en implementering van beleid in die provinsie is die Voedingsprogram se verantwoordelik. Vanweë vroeë aanduidings dat KwaZulu-Natal die voorkomsvlakke van dwerggroei suksesvol verminder het, is hierdie persoon se leierskapsbenadering kwalitatief ondersoek. Die vernaamste bevindinge is dat toegang tot hoë-vlak besluitnemingsprosesse belangrik is vir programsukses en dat voorspraak as 'n sleutelmetode vir die versekering van verbintenis tot die vermindering van kinderwanvoeding geïdentifiseer is.

Hierdie navorsing is gedoen om gehoor te gee aan 'n behoefte aan die identifisering en toepassing van goeie leierskap op die gebied van voeding en aan die beskrywing van hul werk - 'n ontwikkelende veld binne openbare voedingsgesondheid.

Ten slotte: ten einde volhoubare gemeenskappe te kan vestig, behoort voeding sentraal te wees in die toepaslike beleide wat deur inspirerende leierskap uitgevoer moet word.

Trefwoorde: voeding vir volhoubare ontwikkeling, dwerggroei, intervensiestrategie, Suid-Afrika, KwaZulu-Natal

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In December 2011 I was backpacking through Rwanda. I met a child in my host's lounge in Kigali. I thought the little girl was only 18 months, maybe 2 years old, until I was informed by her foster mother that she was in fact nearly 5 years old. "She suffers from stunting", Annonciata told me. At the time I remember being very shocked at how small she was, but had no idea what stunting was. It was not until 2013 that I learned of stunting, the nutritional disorder, in more detail. Both these memories have significant meaning to me. The first one because that holiday solidified my love for the wider Africa and its wonderful people. The second one occurred in a lecture room at the Sustainability Institute, and was the moment when I realised what I wanted to commit my life to, namely the eradication of stunting.

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List of Acronyms and Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
BRICS	Brazil Russia India China South Africa
CCG	Community Caregiver
CHW	Community Health Worker
DAFF	Department of Agriculture, Forestry and Fisheries
DHIS	District Health Information System
DoH	Department of Health
DSD	Department of Social Development
EBF	Exclusive Breastfeeding
ECD	Early Childhood Development
eLENA	e-Library of Evidence for Nutrition Actions
ETD	Electronic Theses and Dissertations
GAIN	Global Alliance for Improved Nutrition
GDP	Gross Domestic Product
G20	Group of 20
HIV	Human Immunodeficiency Virus
HOD	Head of Department
HSRC	Human Sciences Research Council
IFPRI	International Food Policy Research Institute
IUGR	Intra-Uterine Growth Restriction
IYCF	Infant and Young Child Feeding
KZN	KwaZulu-Natal

LS	Lenore Spies
MDG	Millennium Development Goal
MNCWH	Maternal, Newborn, Child and Women's Health
NCD	Non-Communicable Disease
NDP	National Development Plan
NPC	National Planning Commission
OECD	Organisation for Economic Co-operation and Development
OSS	Operation Sukuma Sakhe
PGDP	Provincial Growth and Development Plan
PHN	Public Health Nutrition
RSA	Republic of South Africa
SA	South Africa
SADC	Southern African Development Community
SANHANES	South African National Health and Nutrition Examination Survey
SDG	Sustainable Development Goal
UN	United Nations
UNICEF	United Nations Children's Fund
WHA	World Health Assembly
WHO	World Health Organization

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Chapter 1

1 Introduction

1.1 Nutrition for sustainable development

"Nutrition is crucial to both individual and national development. ... good nutrition is a fundamental driver of a wide range of developmental goals."⁽¹⁾

Sustainable communities are pursued across the world and are especially relevant to developing countries. A vast array of factors contributes to the development of such communities⁽²⁾. This thesis focuses on the fundamental role of nutrition in the realisation of sustainable communities, as nutrition is central to our ability as humans to survive and prosper. Its impact on health and well-being are deeply and complexly intertwined. In the study of human nutrition, food security forms a fundamental part of how we think about the human-food relationship⁽³⁾. Adequate nutrition is a vital aspect of social and economic development, as poor nutritional status directly affects performance, health and survival⁽⁴⁾.

Nutrition is globally recognised as an important element of development, as it underpins the achievement of the Millennium Development Goals (MDGs), an agenda that ends in 2015^(5,6). It is specifically named as part of Goal 2 (End hunger, achieve food security and improved nutrition and promote sustainable agriculture) in the post-2015 Sustainable Development Goals (SDGs), although it is interlaced with all 17 currently proposed goals. The SDGs will be adopted by the United Nations (UN) General Assembly at the end of September 2015⁽⁷⁾. One of the challenges for the nutrition fraternity will be to position nutrition as an important stand-alone entity within the development discourse, but also to portray it as an interlaced element that works in synergy to achieve the other SDGs. Essentially it means that nutrition should be portrayed as an input to and as an outcome of sustainable development^(8,9).

If the purpose of development is to improve freedom of individuals⁽¹⁰⁾, and our knowledge of the effect of poor nutrition, specifically in children in the first 1000 days period (i.e. from conception to a child's second birthday), on the potential to have real freedom⁽¹¹⁾, integrating nutrition and sustainable development thinking requires little argument. Sustainable development thinking must include nutrition specific and sensitive interventions and/or

programmes^A in order to facilitate the potential of real freedom for future populations. Furthermore, nutrition interventions can only be sustainable if supported by the so-called ‘enabling environment’, defined as “political and policy processes that shape and sustain momentum for effectively implementing actions what reduce undernutrition”⁽¹²⁾.

1.2 Global nutrition targets and interventions

The World Health Assembly (WHA), the decision-making body of the World Health Organization (WHO), has several functions, of which the setting of health policy guidance is one. Its members are health ministers of the member states⁽¹³⁾. In 2012, the “Comprehensive Implementation Plan (2012-2025) on Maternal, Infant and Young Child Nutrition”⁽¹⁴⁾ was endorsed as a resolution of the sixty-fifth assembly. Resolutions are statements of intent, i.e. the content is to be adopted by the ministries of health represented at the meetings. In other words, this WHA endorsed nutrition plan should be used as baseline for interventions in member countries. The document draws on a wide range of literature, policy processes and established guidelines and includes stunting as one of several points supporting the rationale for such a plan. The Assembly noted that although policies and programmes exist on a global level, the implementation is poor and the content is not necessarily able to deal with the associated complexity, resulting in intended outcomes not being met. Monitoring and evaluating the coverage of the policies and programmes were described as inadequate and health services as unable to provide the necessary support. The integration of nutrition into national development plans and across sectors was found to be insufficient⁽¹⁴⁾. Interventions with an evidence-base and available at present have been shown to have the ability to reduce the prevalence of stunting by a third over the short term, if implemented timeously and at scale⁽¹¹⁾.

The need for global targets was highlighted in the plan, as this helps to identify areas of priority as well as catalyse change at the global scale. Six ambitious global nutrition targets were set for 2025. These targets were formulated based on a need for new nutrition goals and with the approach of the SDGs in mind, and include the following: firstly a relative reduction of 40% in the prevalence of stunting in children under five, which is a yearly rate of 3.9% (achieved already in 20% of countries in the particular analysis). The current rate is 1.8% per annum.

^A Nutrition specific interventions tackle direct causes of child nutrition and development such as feeding and infectious diseases, whereas nutrition sensitive programmes aim to address underlying causes and supportive services⁽⁴⁵⁾.

Secondly a 50% reduction of anaemia in women of reproductive age (pregnant and non-pregnant); thirdly a 30% reduction in low birth weight and fourthly: no increase in childhood overweight. The fifth global target of the WHA is to increase the rate at which exclusive breastfeeding is practiced to at least 50% with a resultant 10 million more infants being exclusively breastfed for the first six months of their lives. The sixth goal is to reduce and maintain childhood wasting to less than 5%⁽¹⁴⁾. Targets 1 and 5 are of specific relevance to the research study reported in this thesis.

A series of priority actions complementing the set targets (Table 1-1) and to be implemented globally by Member States and partners were also agreed upon. Allowance is made for the need to adapt these interventions at a regional and national scale.

Table 1-1: Priority actions agreed upon by the 65th World Health Assembly to implement the comprehensive plan on maternal, infant and young child nutrition⁽¹⁴⁾

Action 1	The creation of an environment that can successfully facilitate the implementation of comprehensive food and nutrition policies
Action 2	The inclusion of effective health interventions impacting on nutrition in national nutrition plans
Action 3	Recognition and inclusion of nutrition in development policies beyond the health sector
Action 4	The provisioning of adequate resources, both human and financial, so that nutrition interventions are implemented with more success
Action 5	The monitoring and evaluation of policies and programmes

Considering the ambitious targets set by the WHA, it is very important to be clear on interventions and implementation paths and platforms which need to be established, in order to reach the targets. In the literature, nutrition interventions and the implementation thereof for optimum foetal and child nutrition and development are currently considered based on the three pathways framework depicted in Figure 1-1. The basic level (orange) is the enabling environment, which can provide a supportive foundation for programmes and interventions. The following underlying level (green) includes nutrition sensitive programmes. These also provide support to the most direct interventions detailed in the immediate level (blue): nutrition specific interventions. The framework conveys the message that optimum nutrition and development (which reap many benefits) need an integrative and pluralist approach. It shows that

improving dietary, behavioural and health determinants are key to improving nutrition outcomes. These determinants are affected by food security, caregiving resources and environmental conditions, which are shaped by factors like economic and social conditions, national and global contexts, resources and governance⁽¹⁵⁾.

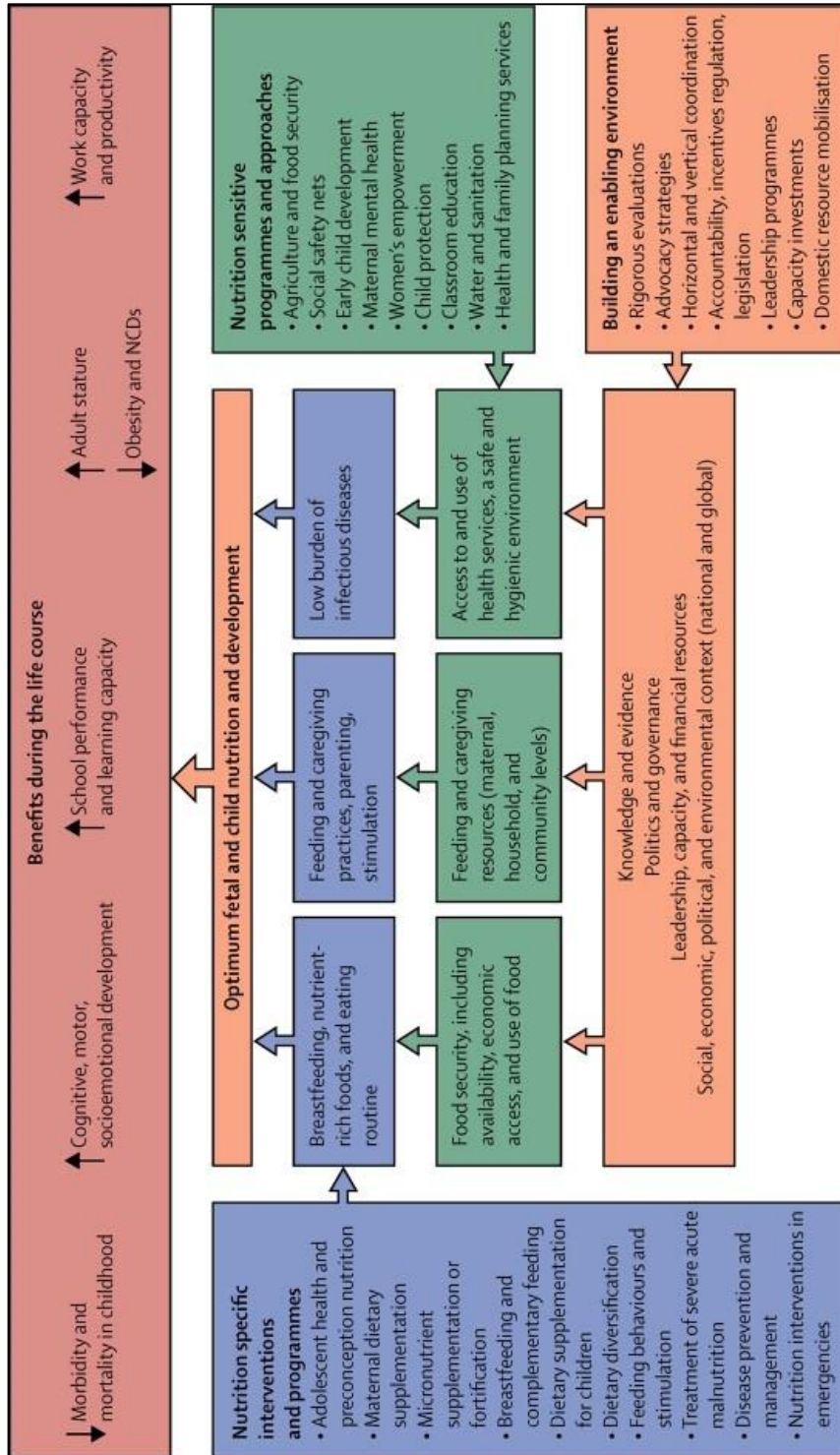


Figure 1-1: Framework for actions to improve foetal and child nutrition and development⁽¹⁵⁾. Source: Black et al, 2013.

With this background on nutrition targets and interventions, Figure 1-2 was constructed as a conceptualisation of the context for the research presented in this thesis. The figure shows some factors (health, education, early childhood development, economic growth and food and nutrition security) as influencing the achievement of sustainable communities. All the factors depicted in this figure have an evidence-base of linkages to the nutrition disorder “stunting”, a central concept to this research. This concept will be described comprehensively in the second chapter. Briefly, undernutrition during the first 1000 days of a child’s life can result in stunting, which has both physiological and cognitive development implications over the lifetime of the individual^(16,17).

In order to achieve a reduction in the incidence of this disorder, and to manage the prevalence of the disorder, several intervention strategies are and should be implemented. The researcher focused only on policy and programmatic interventions in this thesis. The focus will be guided by the 1000 days concept (including maternal health and nutrition and infant and young child feeding) but will have a wider focus on children aged 0-5 years, similar to the broader focus portrayed in the literature and the guiding/policy documents in South Africa. Regardless of the type of intervention, the importance of the first 1000 days of life must be recognised and integrated into the processes and systems that aim to achieve the goals mentioned in this section.

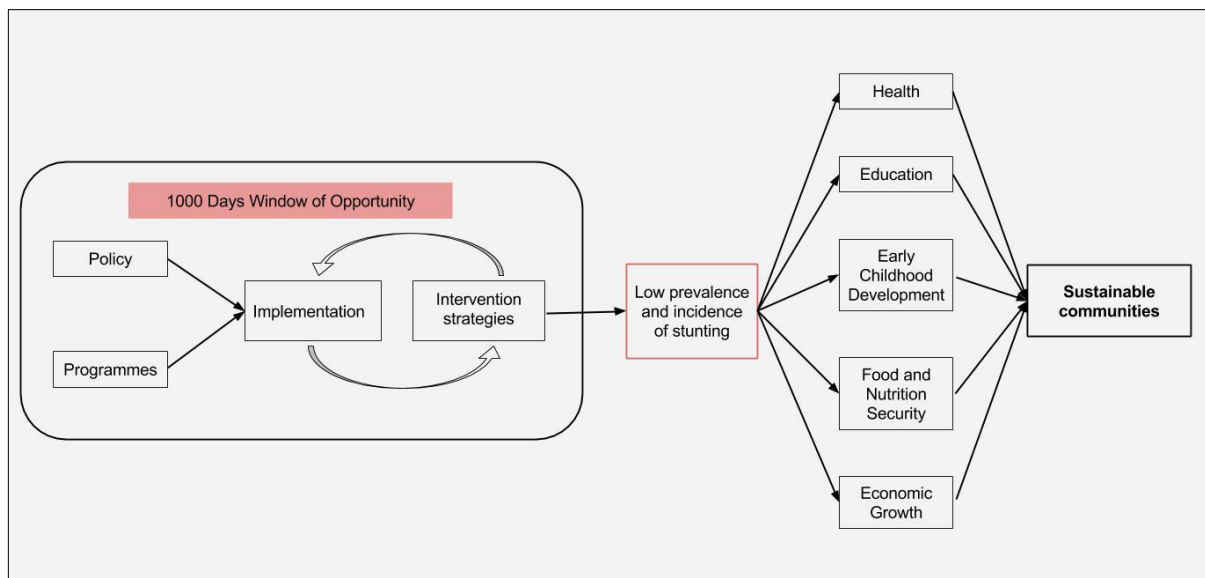


Figure 1-2: Conceptualisation of research focus (Source: Author’s own work)

1.3 Rationale for research

In current mainstream discourse (popular, non-academic texts) about the future, Africa is painted as “rising”, “aspiring”, the current century being “the African”⁽¹⁸⁾. The continent’s prospects seem to be at its best yet⁽¹⁸⁾. This thinking is propagated notwithstanding the realities of demographic projections. The nature of future populations is decidedly young⁽¹⁹⁾. Often highlighted as a pillar of Africa’s growth and development profile is the Republic of South Africa (RSA)^B: economically one of the strongest countries in Africa^(20–22). The country is classified as upper middle income by the Organisation for Economic Co-operation and Development (OECD), although relatively poor growth has existed in recent years⁽²³⁾. South Africa (SA) is the only African country represented in BRICS^{C(24)} and with a permanent seat in the Group of 20 (G20)⁽²⁵⁾, yet its ability to maintain the position as African superpower is questioned⁽²⁶⁾.

Left behind all too often in such mainstream texts are the issues the people of South Africa (and even more so in the rest of sub-Saharan Africa) deal with daily at an individual level: poverty, low levels of education, unemployment, poor housing and a lack of access to basic services such as healthcare. Another issue currently gaining recognition equally important to our thinking about the continent’s future is stunting. This thesis is based on the premise that nutrition is a fundamental component of development and sustainable communities, and that the ongoing prevalence of stunting, one of many nutritional disorders, is a serious challenge to achieving sustainable development as outcome.

^B Republic of South Africa, RSA, South Africa and SA are all used in this thesis and carry equivalent meaning.

^C BRICS is a group of newly-industrialised or developing national economies comprising of Brazil, Russia, India, China and South Africa.

1.4 Research importance

Although studies have been published of the prevalence and implications of stunting, and of nutrition policy reviews, strategies to reduce stunting and the types of interventions to be employed, there is a gap in terms of understanding the nuances of implementing interventions. The following quote from Remans et al. (2011) supports the statement identifying the gap in understanding:

“... the optimal mix of interventions to reduce stunting is much less clear, particularly in regions such as sub-Saharan Africa. [...] by combining proven health-sector interventions with efforts to enhance food and livelihood security, rapid gains toward reducing stunting can be achieved in a relatively short time even in some of the world’s most diverse, challenging, and deeply impoverished settings”⁽²⁷⁾

This research, although also briefly providing an overview of relevant policy and programmes, will attempt to gain insights into the level of implementation. The aim is to use this information to build a strong case for the way forward – how to eradicate stunting in South Africa and on the African continent.

1.4.1 Context: Sub-Saharan Africa - situational analysis

Investigating the nature of intervention strategies for the reduction of stunting in sub-Saharan Africa was prudent in the preliminary stages of this research. To this end, trends of stunting prevalence in the region were summarised, followed by a more in-depth look at how strategies are documented at a national level. With that intention in mind, one country from Western, Eastern, Middle and Southern Africa each were selected to represent the United Nations sub-regions of sub-Saharan Africa. The countries are Ethiopia (Eastern), Sierra Leone (Western), Rwanda^D (Middle) and South Africa (Southern). The countries were selected based on availability and access of national nutrition policies. Access to national policies relevant to this study was a challenge, either because the documents are not readily available, or the language of available documents is not English, and this was a constraint. The WHO Landscape Analysis database as well as the Scaling Up Nutrition movement were used as resources^(28,29).

^D Rwanda is classified as a member of Eastern Africa according to United Nations sub-regions. Unfortunately, at the time, no policy documents were available for any Middle African countries, and due to its location and availability of policy documents, Rwanda was the closest substitute.

1.4.1.1 Trends

Africa, as measured in terms of the WHO region, shows the following concerning statistics in terms of stunting prevalence: a reduction of only 10.7% since 1990. The current figure for stunting is 39.4% of children under 5, which translates to 59.6 million African children. Upon looking at the regions in isolation, it is clear that Eastern Africa has consistently had the highest rate of stunting, with current figures at 41.3 percent; the relative reduction since 1990 is 9.3 percent. Middle Africa has seen the largest relative reduction of 14.6 percent over a 23 year period, for the same period Southern Africa shows a relative reduction of 6 percent and Western Africa 6.9 percent. The lowest burden of stunting lies in Southern Africa, where stunting affects 1.9 million children⁽³⁰⁾. Table 1-2 comprehensively shows the available statistics.

Table 1-2: Prevalence estimates for Africa as percentage of children under 5, region-specific⁽³⁰⁾

Region	Year	Prevalence (% of children aged <5)			
		1990	2000	2010	2013
Africa (WHO Region)		50.1	45.4	40.8	39.4
Eastern (UN Region)		50.6	46.4	42.5	41.3
Middle (UN Region)		46.7	40.1	33.9	32.1
Southern (UN Region)		36.3	33.6	31.0	30.3
Western (UN Region)		40.5	37.5	34.5	33.6
Sub-Saharan Africa (MDG Region)		48.1	43.4	38.7	37.3

At country level, see Figure 1-3, the prevalence trends reported were taken from the 2014 Global Nutrition Report⁽⁹⁾, an International Food Policy Research Institute (IFPRI) product. Although national surveys may represent more current data, this extract of each country serves merely as a preliminary overview.

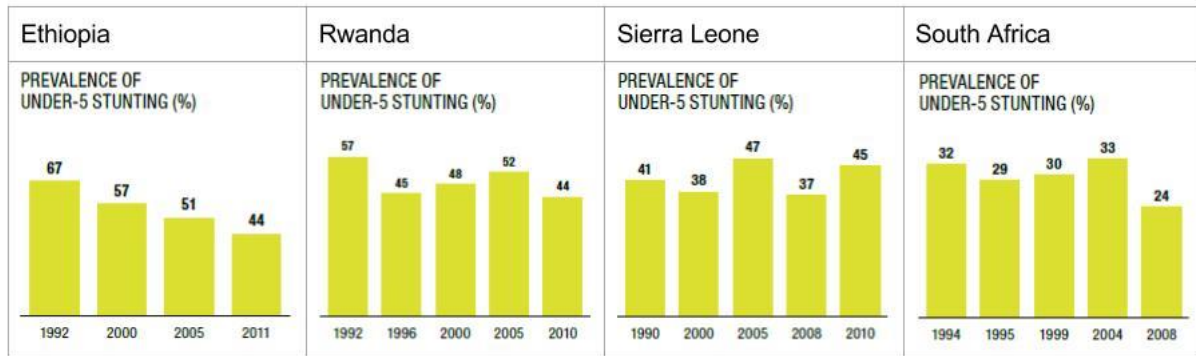


Figure 1-3: Country profiles for stunting prevalence (%) in children under 5. Extracted from the 2014 Global Nutrition Report⁽⁹⁾

1.4.1.2 Documented strategies to reduce child undernutrition and stunting

In order to gain an understanding of how stunting reduction is targeted through nutrition policies, the researcher used the following process of demarcation. The e-Library of Evidence for Nutrition Actions (eLENA), a service provided by the WHO Department of Nutrition for Health and Development, was consulted. Interventions are categorised according to type: behavioural, fortification, health-related actions, supplementation and situational health actions, and by the stage of the life cycle at which the strategy is implemented (infants, children, adolescents, reproductive age, during pregnancy, for postpartum women and older adults). In order to select interventions within the scope of this preliminary investigation, a list of infant, child, pregnancy and postpartum interventions was compared to a list of behavioural, situational health actions and supplementation. Only interventions present on both lists were regarded as relevant to this situational analysis, see Box 1-1, and interventions that are directly related to several other health conditions were excluded, see Box 1-2.

Box 1-1: Nutrition-specific interventions selected for inclusion in the study, with reference to the 1000 Days concept.

Breastfeeding – early initiation, exclusive breastfeeding, continued breastfeeding, education for increased breastfeeding duration
 Complementary feeding
 Supplementary feeding in community setting for promoting child growth
 Low-birth-weight infants – feeding practices, kangaroo mother care
 Supplementation in infants and children– multiple micronutrient powders for home fortification, Vitamin A, Vitamin D, Vitamin E, Iron, Zinc
 Supplementation in pregnant and postpartum women - multiple micronutrient powders for home fortification, energy and protein, Iodine, Iron and Folic Acid, marine oil, multiple micronutrient, Vitamin A, Vitamin D, Zinc
 Nutrition counselling during pregnancy
 Implementation of the Baby Friendly Hospital Initiative

Box 1-2: List of conditions excluded from the study for which interventions are found in the eLENA database

HIV/AIDS	Hypoglycaemia	Neural tube defects
Tuberculosis	Hypothermia	Oedema
Malaria	Diarrhoea	Therapeutic feeding
Anaemia	Obesity	Indirect interventions,
Respiratory disease	Blood pressure	such as conditional
Cardiovascular disease	Pre-eclampsia	cash-transfer
		programmes

In the following section, a general summary of each selected country’s nutrition policy is followed by a description of its contents directly relating to the interventions demarcated through the described process.

1.4.1.2.1 Ethiopia

The Ethiopian government has shown a policy commitment to reducing stunting to a 30% prevalence by 2015 in its 5-year Growth and Transformation Plan. This goal underpins the National Nutrition Programme, which the National Nutrition Coordinating Body manages, along with other goals, such as a focus on the lifecycle approach to improve target groups’ nutritional status, implementing more multi-sectorial interventions and increasing the uptake of fortification programmes⁽³¹⁾.

The National Nutrition Plan preceding the current one (2013-2015) has some documented challenges. These include poor representation of nutrition in the implementation of

programmes, inter-sectorial coordination being inadequate, lack of attention to fortification programmes, the data capturing processes yielding poor integration, mainstreaming of gender in interventions not successful although the theory was well understood and finally that the 1000 days period as well as adolescent and women-specific interventions were not given sufficient attention. Building upon this experience, the second strategic objective of the National Nutrition Programme is to “improve the nutritional status of infants, young children and children under 5”, and several targets are set to this end, including breastfeeding practices in line with global recommendations as well as Vitamin A supplementation⁽³¹⁾.

1.4.1.2.2 South Africa

The Roadmap for Nutrition in South Africa (2013-2017) was published by the National Department of Health, Directorate: Nutrition⁽³²⁾. The policy first assesses current nutrition interventions: maternal supplementation (identified need: calcium supplementation in pregnant women), promotion of optimal dietary practices during the pregnancy, Infant and Young Child Feeding (IYCF) (identified need: increased complementary feeding counselling, exclusive breastfeeding), growth monitoring and promotion (identified need: retraining of cadres involved to ensure better identification of growth faltering and malnutrition), nutrition in the Integration Management of Childhood Illnesses, community based approaches, Vitamin A supplementation, food fortification, management of severe acute malnutrition and nutritional interventions for tuberculosis, Human Immunodeficiency Virus (HIV) and/or Acquired Immune Deficiency Syndrome (AIDS) sufferers. Policy and programme implementation challenges as documented in the landscape analysis are detailed. The major barriers are inadequate implementation of policies, lack of community-based interventions, shortage of human resources, especially nutrition professionals at the district health level, health facilities not having enough copies of guidelines, policies and supplies of supplementation practices, the lack of nutrition training across the health cadre and information systems not being of a good quality⁽³²⁾.

The SA Nutrition Roadmap follows a multi-sectorial approach and recognises the many role players in the public and private sector. It is acknowledged that priority target groups and the 1000 days are to be the focus. This document is intended to serve as a framework for implementation of current and future policies. The goals are to: increase life expectancy, promote optimal growth of children and prevent later obesity, contribute to management of tuberculosis and HIV/AIDS, and to the effective functioning of the health sector, as well as to

empower nutrition-related decision-making at the household and community level. A comprehensive package of interventions is presented. The language is very similar to international guidelines, showing that attention was given to evidence-based interventions. The package includes a detailed process of target populations, the delivery platform and the existing frameworks that can support and be integrated into the interventions. The three main categories of intervention strategies are behaviour change, micronutrient and deworming programmes and therapeutic feeding. The five strategic approaches are (1) to advocate and provide technical support for multi-sectorial action, (2) strategically position nutrition in the health sector, (3) strengthen intervention implementation across the health sector, (4) that the delivery of nutrition services be enabled by the strengthening of human resource capacity, and (5) that the information base be improved to also add to service delivery⁽³²⁾.

1.4.1.2.3 Sierra Leone

The National Food and Nutrition Policy was published in 2009 by the Ministry of Health and Sanitation. It must be noted that this is a constraint as the international guidelines post-date this policy.

In addition to the prevalence estimates of stunting above, the policy states that, of the 36% of stunted children in Sierra Leone in 2008, 21% were severely stunted and a concerning high rate of stunting was prevalent in the age group 24-35 months at 48%. The underlying causes to this nutrition situation are identified as inadequate food supply, ineffective food utilization, inadequate feeding practices, human resource challenges as well as a low rate of education in adults, particularly in women, of whom two thirds never attended any form of schooling⁽³³⁾.

The general objective makes special mention to the improvement of nutritionally vulnerable groups' nutritional status along with the population as a whole. Infants, young children, pregnant and lactating women are in these groups according to the policy. Appropriate feeding practices at the household level are formulated in a specific objective, with two policies resulting. The first is breastfeeding and complementary feeding in line with international guidelines and the second is community and facility-level promotion of appropriate feeding methods. This includes the spread of information about nutrition aimed specifically at household decision-makers (fathers, mothers-in-law and grandmothers). Supplementation and fortification is a particular focus at the community level as a component of the specific objective to strengthen the prevention of nutrition-related diseases⁽³³⁾.

1.4.1.2.4 Rwanda

The National Nutrition Policy was published in 2005 by the Ministry of Health. It must be noted that this is a constraint as the international guidelines post-date this policy.

The overall objective of the policy is “to improve the nutritional status of Rwandan people”⁽³⁴⁾. The policy makes frequent reference to the achievement of MDGs and the importance of fighting malnutrition for all sectors. The expected outcomes of this policy are linked to MDGs. Inadequate feeding practices and primary healthcare are identified as two of the underlying causes of malnutrition. The Baby Friendly Hospital Initiative has not been implemented in Rwanda.

In order to achieve the objectives set out in this policy, there are several strategies in place. Firstly, to reinforce the political commitment, secondly to promote optimal IYCF, thirdly the scaling up of community-based programmes, the fortification of food in the fourth place, also the promotion of household food security, the prevention and management of malnutrition and diseases related to it and finally nutrition support to people living with HIV/AIDS and their families⁽³⁴⁾.

The priority actions include: exclusive breastfeeding for the first 6 months, followed by complementary feeding up to 24 months; appropriate provision of nutrition care and support for malnourished and ill children; supplementation and monitoring of pregnant and postpartum women’s nutritional status⁽³⁴⁾. Even though the Baby Friendly Hospital Initiative is identified as a gap in Rwandan nutrition practices, it is not named as a priority action, although it may fall under the support programme “maternal, infant and young children feeding”, but this is not clear.

A strength of the National Nutrition Policy is the recognised importance of multi-sectorial action to achieve success. A comprehensive list of responsibilities is listed per government ministry, as well as for the private sector⁽³⁴⁾.

Besides the national nutrition policies that were summarised per country, other related policies exist. IYCF strategies were only available for Ethiopia (National Strategy for Infant and Young Child Feeding, 2004) and South Africa (Infant and Young Child Feeding Policy, 2013). Sierra Leone has a policy for ‘Reproductive, Newborn and Child Health’ (dated 2011), and South Africa has a ‘Strategic Plan for Maternal, Newborn, Child and Women’s Health (MNCWH) and Nutrition 2012-2016’.

Although the country nutrition policies in general contain internationally recognised nutrition interventions as part of their projected plans of action, the country stunting profiles suggest a policy-action disconnect. For as long as this disconnect exists, nutrition's contribution to sustainable development will continue to fall short of what is necessary.

1.4.2 Implementing intervention strategies successfully – important factors

This section briefly describes key messages in the literature about the requirements to successful intervention strategy implementation. As an overarching guideline, a focus on the 1000 days concept is vital to the successful reduction in the prevalence of stunting. The evidence that this period represents the window of opportunity should be used as baseline guiding principle for nutrition interventions⁽⁴⁾. The burning question is: what creates successful interventions? The most important component of successful interventions in food and nutrition security (which includes stunting) is the capacity and willingness of developing countries to take action in a manner which is effective and efficient. Furthermore, without ownership, commitment and accountability at the national, regional and local level, interventions will continue facing many challenges to success. For the implementation of nutrition policies (for example IYCF programmes) in particular the commitment from the Ministry of Health supports sustainability, stability and coordination. In addition, sharing of best practice at the regional level also yields better success for interventions⁽³⁵⁾.

Arguing from the perspective that policy is a plan of action, the existence of policy that documents specific strategic goals, regulations, guidelines and programmes, appropriate and informed by evidence, is crucial⁽³⁶⁾. Implementation driven by such policy can increase reduction rates, however when these components are lacking, the process is set up for failure.

Challenges that are barriers to successful interventions, have been documented by Ecker and Nene⁽³⁶⁾. Many governments are administrated in separate sectors (segmented organisation of government bureaucracy) and the very nature of nutrition calls for the opposite approach. These silo-structures make it difficult to orchestrate the multi-sectoral coordination needed to address nutrition's complexities. Moreover, decision-makers are not always fully aware of the reach of malnutrition, and, commitment created by in-country social pressure is therefore often lacking. Another challenge is the lack of financial resources which limits nutrition's power base. Coupled with this is the challenge of qualified human resources (for policy-setting, amongst other functions) which are rare in too many developing countries⁽³⁶⁾.

Challenges documented in Africa in the process of implementing IYCF practices include: availability of funds and size of the budget allocated to comprehensive interventions at the time of implementation, continued stakeholder interest, changes in structures or actors in key positions and the long duration of the process due to government bureaucracy. National development policies that exclude nutrition from the agenda indicate a lack of prominence and understanding of the role of nutrition in driving other development agendas. At the community level, there is also a need for more counselling on IYCF⁽³⁷⁾.

The recommendations for successful nutrition interventions of the 2014 Global Food Policy Report include a multi-sectoral approach in defining goals and targets, comprehensive data from indicators that are monitored and accurately measured, multiple stakeholder processes that should be facilitated and accountability that is promoted⁽³⁵⁾. Furthermore, in order to prevent nutrition policies becoming powerless plans, leadership is needed to provide direction for these actions and to ensure that adequate capacity is built where it is most needed⁽¹²⁾.

1.5 Research originality

In order to ensure that the research presented in this thesis is original, several databases were searched. This process (published literature specific) is described in the first article (chapter 2). Focusing on South African outputs, similar theses submitted to South African universities were searched to avoid duplication using the National Electronic Theses and Dissertations (ETD) Portal for South African theses and dissertations. Research outputs from the South African Human Sciences Research Council (HSRC) database were also searched. A clear gap in the literature was found both locally and internationally.

Keywords used for South African databases were:

“Nutrition policy + stunting + South Africa”

“Nutrition policy + stunting + South Africa + KwaZulu-Natal”

1.6 Research problem, questions and objectives

1.6.1 Research problem

Based on the preliminary investigation and exploration of nutrition policy and programmes, the following problem statement was developed:

Although nutrition policy and programmes seem comprehensive, the prevalence of the nutritional disorder stunting remains at concerning (high) levels in Africa and in South Africa.

Successful intervention strategies must be implemented to achieve lower incidence rates to ensure improved prospects of achieving sustainable communities.

1.6.2 Research questions and objectives

The overarching question this thesis aims to answer is: ‘what are the strategies in place to reduce the prevalence of stunting in South Africa?’

Since there are early indications that one specific province in SA is doing well to reduce stunting prevalence a follow-on question was additionally formulated:

‘What can an investigation of the particular approach followed in KwaZulu-Natal add to the understanding of interventions to address stunting at provincial level in South Africa?’

The investigation following these questions is structured into two journal articles (further description of the structure follows in section 1.7).

1.6.2.1 Article 1

Question: To what extent is stunting in young children a feature in South Africa and which strategies are in place to reduce the prevalence thereof?

Objectives:

- a. To produce an up-to-date review and comprehensive oversight of the global policy and programmatic frameworks in which to contextualise the South African situation
- b. To describe trends and the status quo of stunting as a feature of child health and anthropometry in South Africa
- c. To compile an overview of recent South African Department of Health nutrition policy and programmes in the context of addressing stunting
- d. To compile an overview of policies from other South African National Government Departments that have direct or indirect bearing on stunting

1.6.2.2 Article 2

Questions: What contribution towards reducing the prevalence of stunting in KwaZulu-Natal (KZN) has been made by the provincial Department of Health’s Director of the Nutrition Programme? What are the key features of the leadership approach towards effective nutrition service delivery and advocacy?

Objectives:

- a. To compile an overview of the status quo in KwaZulu-Natal with reference to child undernutrition and specifically stunting
- b. To gain insights into the experience of nutrition intervention implementation from the perspective of a government stakeholder (KwaZulu-Natal Department of Health: Nutrition Programme Director)
- c. To frame the experience of the Nutrition Programme Director in the context of the enabling environment for nutrition interventions

1.7 Overview of structure and methodological tools

The thesis follows the format of two free-standing academic journal articles in the layout and style described by the School of Public Leadership in accordance with the requirements of Stellenbosch University. The articles are preceded by the current chapter, which serves as an overarching introduction to the research and to provide the reader with contextual background information.

1.7.1 Article one: Documented strategies to reduce the prevalence of stunting in South Africa: national policies and development goals

The purpose of this article is to create an understanding of stunting as a nutritional disorder and to frame it in the South African context, embedded within the sub-Saharan Africa and middle income country contexts. A desktop investigation of stunting magnitude and trends in South Africa and an overview of current global intervention strategies was undertaken. Several national policies of South Africa were summarised in terms of their perspective and approach to stunting.

1.7.2 Article two: Strategies to reduce stunting in KwaZulu-Natal: the case of the Department of Health, Provincial Nutrition Programme Director

This article aims to sketch the profile and leadership approach of the director of the Nutrition Programme: Provincial Department of Health, KwaZulu-Natal. This profile contributes to growing “best practice” knowledge of leadership in provincial government and the capacity thereof to deliver effective nutrition services and advocacy. Primary investigation was conducted and data collection was done by means of a semi-structured interview. This qualitative approach allows the interviewer to frame questions during the interview⁽³⁸⁾ as well as a flexibility to the interview when the aim is to discover those parts of the implementation

process to which a mere review of policy and programmatic documents will (likely) be blind. In order to achieve this it is important to remain non-directive as far as possible. The discussion guidelines were developed from the objectives of this research project (see addendum C).

Specifically relating to interviews, to overcome criticisms (information distortion and research selectivity effect) the following guidelines were applied:

- An awareness of possible distortions of information.
- Utilising a diversity of research activities to ensure that interviews are not the sole source of information.
- Obtaining consent to record and transcribe the interview from the interviewees^(39,40).

Additionally, a desktop-based overview of policy documents and strategies from the KZN Premier's Office and provincial Department of Health was completed. Recent national nutrition survey results were used to frame trends.

It is appropriate at this point to remind the reader that these articles, although part of a single thesis, are written as standalone articles and hence some repetition and cross referencing between the articles may occur. Attempts have been made to minimise this. Both articles are aimed at the Public Health Nutrition (PHN) Journal and the format of the articles complies with the instructions for authors of that journal. Author's instructions for PHN can be found in addendum A. Although this style of writing a thesis has its limitations in terms of length (i.e. depth to which information can be communicated), the advantage of near immediate suitability for publication is sufficient justification. The rationale for this style is reinforced given the gap in the literature about stunting and nutrition policy (Article 1) and the level of implementation for nutrition interventions (Article 2).

The final chapter is the overarching conclusion, binding the thesis together. In this chapter the key findings and arguments are presented. Recommendations are made regarding the need for further research and implementation.

1.8 Key concepts

The following terms are used frequently in the thesis or are fundamental to understanding formulated arguments in the thesis. A short definition or description is given below, and may be repeated or elaborated upon in the context where it is used.

Sustainable development: Several definitions of sustainable development exist. The Brundtland report of 1987 defined it as follows: “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”⁽⁴¹⁾. More recently, it has been defined as “development that meets the needs of the present while safe-guarding Earth’s support system, on which welfare of current and future generations depend”⁽⁵⁾. This points more to the interconnected nature of human and planetary welfare. It is from this perspective that this thesis is written.

Food security: The definition used in this thesis is from the 1996 World Food Summit, which states that food security exists when “all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”⁽⁴²⁾.

Nutrition security: A condition when all people at all times consume food of sufficient quantity and quality in terms of variety, diversity, nutrient content and safety to meet their dietary needs and food preferences for an active and healthy life, coupled with a sanitary environment, adequate health and care⁽⁴³⁾.

Undernutrition: Used interchangeably with hunger. It is the outcome of the following factors combined: insufficient food intake, inadequate care and infectious diseases. It includes several specific disorders: underweight, stunting, wasting and micronutrient deficiency⁽⁴⁴⁾.

First 1000 days: The period from conception to a child’s second birthday, considered as a window of opportunity for growth and development⁽¹⁷⁾.

Stunting: A nutritional disorder resulting in failure to reach potential height. It most often manifests during the first 1000 days of life. Diagnosed when a child’s height-for-age, measured against the WHO Child Growth Standards median, is less than minus 2 standard deviations (moderate stunting) or less than minus 3 standard deviations (severe stunting)⁽¹⁷⁾.

Nutrition specific interventions: Interventions or programmes geared towards immediate determinants of nutrition and development such as feeding, nutrient intake, caregiving practices and disease prevention⁽⁴⁵⁾.

Nutrition sensitive programmes: Nutrition-sensitive programmes draw on complementary sectors, addressing important underlying determinants of nutrition. These can act as springboard for upscaling nutrition specific interventions⁽⁴⁵⁾.

Enabling environment: This concept is defined as the political and policy processes that shape and sustain momentum for effectively implementing actions that reduce undernutrition. It is made up of three sections: 1) the framing, generation and communication of knowledge and evidence, 2) the political economy of involved stakeholders and ideas, and 3) the capacity of individuals and across organisations and available financial resources⁽¹²⁾.

Multi-sectoral: As nutrition has a suite of determinants not limited to a single sector (sphere of activity), it is referred to as a multi-sectoral problem. Its solutions therefore must also come from more than one sector⁽⁴⁶⁾. Multi-sectoral work is defined as “Working more comprehensively to bring the policies, programs, resources and actions to bear at the same time and place on the same child”⁽⁴⁷⁾.

Multi-disciplinary: Work drawing on the knowledge of more than one discipline, as represented by the individuals involved, in collaboration, with the aim of providing different perspectives on the problem and solution⁽⁴⁸⁾.

1.9 Ethical implications of the research

All ethical procedures were followed according to guidelines provided by the Research Ethics Committee: Human Research (Humanities), Stellenbosch University (Reference: DESC-Muller/2014), see addendum B. The research was classified as “low risk”. The literature, policy and programme documents reviewed are all publicly available.

No discomfort was foreseen for the participant for the interview section of the research. The content which the participant shared was a professional opinion and retelling of her experience. Interview participation was free and voluntary. Written consent (see Addendum E) was provided by the participant and permission for the research was granted by the KwaZulu-Natal Department of Health: Provincial Health Research & Ethics Committee. The consent form was made available to the participant in advance and opportunity for questions was given.

Chapter 2

2 Documented strategies to reduce the prevalence of stunting in South Africa: national policies and development goals

2.1 Introduction

2.1.1 Nutrition for sustainable development

Nutrition is central to our ability as humans to survive and prosper – its impact on health and well-being are deeply and complexly intertwined. In the study of human nutrition, the understanding of the concept of food security is fundamental to our thinking about the human-food relationship⁽³⁾. The 1996 World Food Summit definition of food security^E is used as frame of reference for this article. Adequate nutrition is a vital aspect of social and economic development, as poor nutritional status directly affects performance, health and survival⁽⁴⁹⁾. At a national level, the cost of malnutrition places a heavy burden on efforts towards sustainable economic growth and improved welfare⁽⁵⁰⁾. Nutrition is globally recognised as an important element of development. It underpins the United Nations' (UN) Millennium Development Goals, due to expire at the end of 2015. With its expiration date looming, the development discourse is focussed on how to bring sustainable development to all regions of the world and on what goals to put in place post-2015. The discussion ranges from formal consultation processes orchestrated by the UN to academic debates to blogs^(51,52). These goals are referred to as the Sustainable Development Goals (SDGs). The process to develop these was initiated after the UN Rio 20+ Summit in 2012⁽⁵⁾. The final list of 17 SDGs will be tabled for approval at a meeting of the UN General Assembly in September 2015. Nutrition features in goal 2: 'End hunger, achieve food security and improved nutrition and promote sustainable agriculture'⁽⁷⁾.

There has been an increased understanding among politicians that nutrition is central to achieving a range of development goals^(35,53), although translation into prioritised national policies in developing countries has not been widespread^(36,54). Thus, in order to improve the

^E The World Food Summit definition states that food security exists when "all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life"⁽¹¹⁴⁾

possibility of achieving sustainable communities on the African continent, urgent and adequate action and advocacy for nutrition must be at the forefront of the development discourse.

2.1.2 The nutritional disorder “stunting”

Stunting is one of many nutritional disorders or types of malnutrition⁽¹⁶⁾ and is defined as an individual’s failure to reach the potential height, determined by genetics. According to the UN Children’s Fund (UNICEF), stunting is diagnosed when a child’s height-for-age is less than minus 2 standard deviations (cases of moderate stunting) and less than minus 3 standard deviations (cases of severe stunting) from the median of the World Health Organization (WHO) Child Growth Standards⁽¹⁷⁾. Stunting is a process that most often occurs during the first 1000 days of life (conception to the child’s second birthday), with detrimental and often irreversible consequences. Chronic maternal malnutrition and child undernutrition is the cause most associated with the manifestation of this disorder^(17,55). Some other determinants of stunting are intra-uterine growth restriction (IUGR), frequent infections during this period, or inadequate nutrition and care, and/or micronutrient deficiencies^(56–58).

Some elaboration of the causes and impact of stunting is prudent. The growth of the foetus during pregnancy is affected by the nutritional status of the mother. When the quality, quantity and diversity of the diet continue to be low during the first two years of the child’s life, it can significantly impact on his or her linear growth^(16,27). The focus on the first 1000 days means that special attention is given to the pregnant woman (i.e. her nutritional, economic and social status), women in general, and then on the child’s first two years (including for example child care in addition to nutrition)⁽³⁶⁾. Compromised motor and cognitive functioning and development are part of the life-long impacts of stunting. Impaired cognitive development has an effect on educational outcomes later in life. The outcomes of stunting further include lower earning potential as adults and less productive contributions to the workforce due to compromised intellect, slighter build and proneness to disease^(59–62). The intensity to which these deficits develop is strongly correlated to the age when undernutrition is experienced. Stunting in early life is associated with a higher risk of obesity and non-communicable diseases when that infant becomes a child and later an adult^(16,27). Unfortunately the diagnosis of stunting is not limited to the individual as it is an intergenerational disorder. In other words, a mother who suffers from stunting will in all likelihood bear a stunted child, and so the vicious cycle continues^(17,63). Yet, when the nutrition of pregnant women and young children is improved, the evidence shows substantial improvements in human capital and economic productivity⁽⁵⁹⁾.

Globally, the latest data on stunting shows a reduction in prevalence. However, the total number of children affected by this physical and cognitive condition still remains very high and is estimated at 161.5 million children under the age of five in 2013⁽⁶⁴⁾. This figure represents one quarter of children in this age group worldwide⁽⁵⁷⁾.

Alarming, for the African continent, the data shows that 39.4% (59.6 million) of children younger than 5 years were stunted in 2013. The percentage prevalence for this age group has not changed much (relative reduction rate 10.7%) since 1990⁽³⁰⁾. In some African countries, stunting prevalence has stagnated or even increased⁽⁴⁾. Taking into consideration the projections of population growth, specifically in Africa⁽⁶⁵⁾, this burden is even more distressing. Another important consideration of stunting in Africa is the diversity of national contexts, especially when making comparisons or recommendations of so-called “best-practise” interventions strategies. In other words, ‘one-size-fits-all’ thinking around interventions is impractical.

Globally, a target has been set by the WHO to reduce the prevalence of stunting in children under five by 40% during the period 2010 to 2025⁽¹⁴⁾. This is a bold statement about the urgency of this nutritional disorder. Although other nutrition disorders are also important, this article prioritises stunting as its focus.

2.1.3 The complexity of addressing stunting

Globally, in order to achieve a reduction in the incidence of stunting and to manage the prevalence of this disorder, several interventions strategies should be implemented. As public health challenges are complex in nature, the interventions have complex chains of causality, and this is particularly the case when the interventions require behaviour change⁽⁶⁶⁾. This complexity has brought the need for multi-sectoral and multi-disciplinary approaches to be embedded in intervention strategies⁽⁶⁷⁾. Multi-sectoral approaches require collaboration from a range of sectors that are related to nutrition, as improving child nutrition is not causally limited to a single sector⁽⁴⁶⁾. Multi-disciplinary action means that individuals representing different disciplines should work together, bringing their expertise together to study and solve the problem from a variety of perspectives⁽⁴⁸⁾. Stunting has been characterised as a wicked problem, which refers to the fact that the solutions are not easy, nor are they simply formulated^(68,69). Due to increasing acceptance of the complexity that exists in both understanding and solving problems such as stunting on the African continent, there is a move towards a pluralist and multi-sectoral response⁽⁷⁰⁾. Coordination amongst different sectors and disciplines is essential to facilitate the success of such a response⁽⁷¹⁾.

One pathway to action and interventions is through policy. Simply defined, policy is a plan of action, a declaration of common interest and the institution of means that can protect that interest. Policy shows intent. The policy actors are decision makers that can be within government or political institutions, but not necessarily. More comprehensively, the study of public policy aims to explain the process(es) whereby public actions are produced. The impact of these actions is meant to reach beyond the political system⁽⁷²⁾. Policies indicate priorities of action and expense. Public policy is action aimed by government on the public, yet other stakeholders also influence the process. By implication there is some political component^(50,73). Echoing Gilson and Raphaely, documentation of policy analysis of nutrition and other health work is scarce and varied, although it is clear that politics, process and power are elements that should form part of health policy and practice investigation⁽⁷⁴⁾.

2.1.4 The relevance of this study

In order to understand stunting in South Africa, within the sub-Saharan Africa and middle income country contexts, the aim of this study was to compile an overview of documented South African intervention strategies and policies related to this nutrition disorder. This was deemed relevant through undertaking a comprehensive search of the literature in order to assess the nexus of nutrition policy and stunting reviews or studies. Highwire Press, the Cochrane Library and MEDLINE databases were searched for English-language publications between January 2000 and March 2015. The large time interval was decided upon based on preliminary searches indicating the existing gap. The following primary search strategy was used for systematic reviews in the Cochrane Library: “nutrition” AND “policy”^F AND “stunting” AND “South Africa”. MEDLINE and Highwire Press databases were searched for “nutrition” AND “policy” AND “stunting” AND “South Africa”. Highwire Press searches included items from PubMed that are not hosted by Highwire. Table 2-1 shows the number of hits per database for the given search terms in the first round of searches. Table 2-2 shows the actual number of hits that were relevant to this study.

^F The term “policy” was selected without specifications due to the multi-sectoral nature of nutrition and stunting.

Table 2-1: Preliminary policy search and number of hits per database for given search terms

Cochrane Library	MEDLINE	Highwire Press
18	9	253

Table 2-2: Actual number of hits relevant per database for given search terms relevant to research objective

Cochrane Library	MEDLINE	Highwire Press
0	5	20

As argued above, stunting is a significant feature of public health and development importance in the world, and especially in sub-Saharan Africa. In order to increase the likeliness of achieving sustainable communities, with low levels of stunting incidence and prevalence, interventions must be implemented successfully. This study will focus on documented intervention strategies, guided by the first 1000 days concept.

2.2 Methods

2.2.1 Study Area

The Republic of South Africa (RSA) is a country in Southern Africa with a constitutional democracy as form of government⁽⁷⁵⁾. The population size amounts to approximately 54 million people⁽⁷⁶⁾. The World Bank classifies RSA as an upper middle income country with Gross Domestic Product (GDP) worth US\$ 366.1 million in 2013⁽⁷⁷⁾. RSA was invited to join the BRIC group in 2010. After the inclusion of South Africa, the group now goes by the acronym BRICS (Brazil, Russia, India, China and South Africa). The group represents emerging national economies, developing or newly-industrialised⁽²⁴⁾.

Poverty rates in RSA are high (53.8% of total population)⁽⁷⁷⁾ and inequality is of the highest in the world⁽⁷⁸⁾. Inequity between population groups and rural or urban location makes describing malnutrition prevalence challenging⁽⁷⁹⁾. Stunting prevalence in the relevant age group (0-5 years) is approximately 21.5%⁽⁸⁰⁾; further discussion follows in section 2.3.1. Overweight and obesity among children are also of concern. Furthermore, obesity, hypertension and diabetes are high burden problems among the adult population. This profile indicates that RSA is undergoing a nutrition transition, meaning that preventable non-communicable diseases (NCD)

are on the rise⁽⁸⁰⁾. This creates the so-called double burden of malnutrition and disease^G, although it is compounded with Human Immunodeficiency Virus (HIV) and/or Acquired Immune Deficiency Syndrome (AIDS) and other challenges, referred to as the triple burden of disease⁽⁸¹⁾. Coupled with high levels of injury and trauma, the health profile of the RSA is currently described as the “quadruple burden of disease”⁽⁸²⁾.

2.2.2 Design

In order to compile a comprehensive overview of stunting and documented intervention strategies in South Africa, this article aims to answer two questions. The first question relates to the magnitude of the problem and the second to national policy intervention strategies.

2.2.2.1 Question 1: What is the magnitude of stunting in South Africa and what are the major trends?

The UNICEF-WHO-World Bank Joint Child Malnutrition Estimates, published in 2014, is the most recent international document of regional child growth and malnutrition figures⁽³⁰⁾. In South Africa, the most recent national survey of nutritional data was published in 2013. This data forms part of the South African National Health and Nutrition Examination Survey (SANHANES-1), the country’s first national “comprehensive health and nutrition study”. It reveals important information about emerging epidemics like NCDs⁽⁸⁰⁾. These two sources were used to describe the stunting profile for RSA.

2.2.2.2 Question 2: What interventions related to stunting are documented in the South African national policies?

To identify national policies that have direct or indirect bearing on stunting, the researcher started by consulting the national Department of Health website for policy documents currently under implementation. Other national policies were identified due to overarching relevance to development planning in South Africa, public participation processes in the public discourse during the research timeline, or based on inclusion in the Presidency Report (referred to with brief summary in section 2.4).

Access to South African policies was gained through searching the relevant government department websites, other online searches as well as using the WHO Landscape Analysis database as an additional resource. Coupled with the database searches described in section

^G Co-occurrence of under- and overnutrition in a population.

2.1.4, some hand-searching of bibliographies of selected studies and reviews was conducted to describe most comprehensively the situation in South Africa.

2.3 Results

2.3.1 Magnitude and trends of stunting

The UNICEF-WHO-World Bank Joint Child Malnutrition Estimates show an overall reduction in stunting of just over ten percent in Africa (50.1 to 39.4%)⁽³⁰⁾. Over a 21 year period, Southern Africa shows a relative reduction of 5.4 percent. The lowest regional burden of stunting lies in Southern Africa⁽⁸³⁾. According to the Global Nutrition Report, the annual reduction rate of stunting in children under 5 in South Africa is 2.4%. In order to meet the WHA target of a relative reduction in stunting of 40% by 2025, this rate is required to be 3% annually⁽⁹⁾.

SANHANES-1 showed that the highest prevalence of stunting in the country is in the youngest cohort of children, i.e. 0-3 years of age, for both boys (26.9%) and girls (25.9%). The overall trend of stunting prevalence in South Africa has seen a decline. However, this was not the case for the age group 0-3. An increase of 11.7% in stunting prevalence was found in this age cohort compared to the 2005 National Food Consumption Survey. Interestingly, if the statistics of boys and girls are compared for the area in which the child lives, there is a difference in highest prevalence location. Boys in rural informal areas have the highest prevalence, whereas for girls, the highest percentage is found in urban informal areas. When the data was adapted to global data (i.e. 0-5 age group), the overall prevalence for stunting is 21.5% for South African children under five⁽⁸⁰⁾.

2.3.2 Documented intervention strategies related to stunting in the South African national policies

By applying the search strategy described in the methods section, the following policies were identified as relevant to the description of documented interventions strategies to address stunting in RSA: The Roadmap for South Africa; The Infant and Young Child Feeding Policy, the Strategic Plan for Maternal, Neonatal, Child and Women's Health and Nutrition, the National Policy on Food and Nutrition Security, the draft Early Childhood Development Policy and the National Development Plan for SA.

A general summary of each policy is provided in this section, interspersed with highlights of its contents relevant to the objectives of this study. For the purpose of this investigation of interventions to reduce stunting, interventions of all categories were highlighted. Due to the

nature of the different policies and the governmental sectors that implement them, more nutrition specific interventions are contained within the Department of Health (DoH) policies, with nutrition sensitive interventions more strongly represented within other policies.

2.3.2.1.1 The Roadmap for Nutrition

The Roadmap for Nutrition in South Africa (2013-2017) was published by the DoH, Directorate: Nutrition⁽³²⁾. The policy describes the assessment of the following current nutrition interventions, all nutrition specific in nature:

- maternal supplementation (identified need: calcium supplementation in pregnant women);
- promotion of optimal dietary practices during the pregnancy;
- Infant and Young Child Feeding (IYCF) (identified need: improvement in exclusive breastfeeding, focus on increased complementary feeding counselling);
- growth monitoring and promotion (identified need: retraining of cadres involved to ensure better identification of growth faltering and malnutrition);
- nutrition in the Integration Management of Childhood Illnesses;
- community based approaches;
- Vitamin A supplementation;
- food fortification;
- management of severe acute malnutrition and nutritional interventions for tuberculosis and
- nutrition interventions for HIV and/or AIDS sufferers.

Policy and programme implementation challenges as documented in the Landscape Analysis⁽⁸⁴⁾ are detailed. The major barriers were inadequate implementation of policies, lack of community-based interventions, shortage of human resources, especially nutrition professionals at the district health level, health facilities not having enough copies of guidelines, policies and supplies of supplementation practices, the lack of nutrition training across health cadres and information systems not being of a good quality⁽³²⁾.

The Roadmap states support for a multi-sectoral approach and recognises the many nutrition role players in the public and private sector. It is acknowledged that priority target groups and

the first 1000 days are to be the focus. This speaks directly to the focus of the current article. Although the interventions seem to be on par with global guidelines, it lacks evidence of the multi-sectoral integration required. Perhaps as a first step in that direction, this document is intended to serve as a framework for implementation of current and future policies.

The goals of the policy are to: increase life expectancy, promote optimal growth of children and prevent later obesity, support the management of tuberculosis and HIV/AIDS, contribute to the effective functioning of the health sector, as well as to empower nutrition-related decision-making at the household and community level. A comprehensive package of interventions is presented. The language is very similar to international guidelines, showing that attention was given to evidence-based interventions and best practice approaches. The package includes a detailed process to target populations, the delivery platforms and the existing frameworks that can support and be integrated into the interventions. The three main categories of intervention strategies are: behaviour change, micronutrient and deworming programmes and therapeutic feeding. The five strategic approaches are to: (1) advocate and provide technical support for multi-sectoral action, (2) strategically position nutrition in the health sector, (3) strengthen intervention implementation across the health sector, (4) enable the delivery of nutrition services by the strengthening of human resource capacity, and (5) improve the information base to also add to service delivery⁽³²⁾.

2.3.2.1.2 Infant and Young Child Feeding Policy

This 2013 DoH policy was developed by the National Directorate Nutrition. It is intended to replace the out-dated 2007 South African national policy. Its vision is “to promote optimal nutritional status, growth, development and improve health and child survival outcomes” in children from birth to 5 years of age. This age group (infants and young children) is the primary target beneficiaries, with other role-players as secondary beneficiaries. The aim of the policy is the definition of strategies and actions relevant to appropriate feeding practices, including within the HIV context. It goes further than mere definition to promote, support and protect these feeding practices⁽⁸⁵⁾.

Eight key components are highlighted in the IYCF policy: 1) the early initiation of breastfeeding in health facilities, followed by 2) exclusive breastfeeding for 6 months, and 3) continued breastfeeding up to at least the child’s second birthday and beyond. Feeding infants at risk of HIV or with HIV-positive mothers is the 4th component and in 5th place appropriate commercial formula practices are described. In the 6th place, complementary feeding is discussed. Difficult

circumstances guidelines and strategies is the 7th component, followed by finally looking at 8) the responsibilities of health care staff at all levels, for maternal, women, neonatal and child health⁽⁸⁵⁾.

This policy is focussed on nutrition specific interventions, again showing correlation with global guidelines and adaptation to issues of particular local significance. With regard to stunting, it is not mentioned beyond statistical summaries and in the situational analysis, which is found in an annex. Multi-sectoral action is recognised as relevant to activities relating to breastfeeding practices.

2.3.2.1.3 Strategic plan for Maternal, Newborn, Child and Women's Health (MNCWH) and Nutrition

Another policy that falls under the direction and development of the National DoH, is a 5 year strategic plan expiring in 2016. The background to this policy is high mortality and morbidity amongst mothers and children, and the reduction thereof is the focus. The dependence of good services on the health system working well is recognised. Public health care re-engineering is identified as crucial to the successful implementation of the interventions of this policy⁽⁸⁶⁾. With regard to stunting, an annual reduction of 1% is set as goal for the period 2009-2014, and further targets are implied but not found.

Five categories of priority interventions are described in this policy document: firstly, maternal health, which includes antenatal care; HIV testing and management; assistance during labour and post-natal care. Secondly, interventions for newborn health are discussed. Breastfeeding and kangaroo mother care are two prominent interventions listed. Thirdly, child health-specific interventions mentioned are IYCF, management of childhood illnesses and school health services. The fourth category is women's health, of which contraceptives and gender-based violence services are some of the named interventions. The fifth category is community-based maternal and child health services. These interventions are at ward-level^H, are multi-sectoral in nature and include a communication strategy⁽⁸⁶⁾.

Within the strategic plan, there are three overall goals. These are to reduce maternal mortality ratio and neonatal, infant and child mortality by a minimum of 10% by the end of the policy timeline; to empower women, to ensure universal access to reproductive health services, and finally to improve the nutritional status of mothers and children. With regard to nutrition this is

^H Refers to the geopolitical sub-level of a municipality.

not very specific, as a suite of indicators measure this. Streamlining the monitoring and evaluation required to document success of interventions to achieving goals would benefit from more directive goal-setting. Furthermore, eight strategies for priority interventions are highlighted as depicted in Box 2-1.

Box 2-1: Key strategies for implementation of priority interventions in the Maternal Neonatal, Women and Child Health and Nutrition Strategic Plan 2012-2016

1. Address inequity and social determinants of health
2. Develop a comprehensive and coordinated framework for MNCWH and nutrition service delivery
3. Strengthen community-based MNCWH and nutrition interventions
4. Scale up provision of key MNCWH and nutrition interventions at PHC and district levels
5. Scale up provision of key MNCWH and nutrition interventions at district hospital level
6. Strengthen the capacity of the health system to support the provision of MNCWH and nutrition services
7. Strengthen the human resource capacity for the delivery of MNCWH and nutrition services
8. Strengthen systems for monitoring and evaluation of MNCWH and nutrition interventions and outcomes

2.3.2.1.4 National policy on food and nutrition security

This policy was co-developed by the National Department of Social Development (DSD) and the Department of Agriculture, Forestry and Fisheries (DAFF) and came into effect in August 2013. According to its introduction, three reasons exist for its urgent need. Firstly, that common definitions and measures are needed for a common understanding. This should be aligned with the national Vision 2030 (the National Development Plan (NDP), see section 2.3.2.1.6). The second reason is that, due to the inter-disciplinary nature of food and nutrition security¹, this policy seeks to provide an over-arching guideline for optimal cooperation between sectors. Thirdly, RSA's position of leadership within the Southern African Development Community (SADC) requires a platform to guide international obligations⁽⁸⁷⁾.

What is called the 'essence' of the policy is "build[ing] on existing initiatives and systems"⁽⁸⁷⁾ with a strong focus on improved coordination. This policy provides a platform for various strategies and argues for the integration of policies and programmes across a range of government departments. Five pillars make up the foundation of the policy: improved nutritional safety nets; nutrition education; investments in agriculture that are geared toward local economic development; improvements in market participation and risk management with

¹ Nutrition security has requirements that are complementary to food security. A household achieves nutrition security "when it has secure access to food coupled with a sanitary environment, adequate health services, and knowledgeable care to ensure a healthy life for all household members"⁽¹¹⁵⁾

relation to production challenges; and protection of agricultural land and information management systems⁽⁸⁷⁾.

In terms of measuring food and nutrition security, anthropometric indicators like height-for-age for the diagnosis of stunting is mentioned in the section about indicators. No specific set of tasks or method to collect this data is detailed, and thus no responsibility is allocated. In this sense the policy fails to go beyond stating the need and describing the features of a food and nutrition security policy.

2.3.2.1.5 Draft early childhood development policy

This draft policy of more than 160 pages, developed by the National DSD, in coordination with UNICEF, is currently the framework for public comment and input and should not be considered as the official government policy position. The public comment process ended on April 24th, 2015. Due to its relevance to this article the draft policy is included, but should be considered in the context of its unofficial status.

All children in the RSA are guaranteed universal availability and access to early childhood development (ECD) services from birth to entrance to formal schooling. This policy is aimed at addressing critical gaps, given the “tremendous importance of the early years”⁽⁸⁸⁾. Furthermore, it seeks to “create an enabling, multi-sectoral framework to guide actions and ensure a coordinated response of public and private sector stakeholders, communities, parents and caregivers”. Its objectives are to ensure universal availability of ECD services that are comprehensive, age- and stage-appropriate and of good quality; to ensure access to these services; and to empower parents to participate in the development of their children.

Although only in draft stages, the policy mentions the development of a multi-sectoral food and nutrition strategy for children under 5. It is not clear where the responsibility of implementing this policy will lie, or which sectors are to be involved. The timeline connected to this policy is 2016. The description of the future policy includes the bold goal of completely eradicating stunting by 2029. Programmatically, the draft ECD policy shows intended prioritisation of pregnant women and children under 2, implying the importance of the first 1000 days. In terms of identified roles and responsibilities, this draft ECD policy is the most clear. The final stages of policy development (ongoing) will no doubt aim to fine-tune the policy and actionable intervention implementation.

2.3.2.1.6 National Development Plan

The most current document for mainstreaming development in the country is the 2012 National Development Plan (NDP) Vision 2030. The 489 pages long document was collated through a public participation and collaborative process under direction of the National Planning Commission (NPC)^J.

In summary, the NDP has three central goals to be achieved by 2030. Firstly, to reduce poverty; secondly to eliminate inequality; and, in the third place, to reduce unemployment. The developmental state that the NDP proposes builds the capabilities of people to improve their own lives, while intervening to correct historical inequalities. The resource most required to achieve these goals is, according to the NDP, already existing in its people. Recognising that the youth is both a resource to be utilised and to be developed, the NDP calls for more opportunities for young people in ways that promote gender equality⁽⁸⁹⁾.

Chapter 6 of the NDP deals with an integrated and inclusive rural economy. The objective is to create more opportunities that enable people to overcome poverty. Undernutrition is said to be the “direct outcome of food insecurity” and the chapter focuses on the relationship between food security and human capital. It mentions the one-in-five prevalence of stunting in South Africa’s young children. The distinction is made between national food security and access to food by the poor, in other words, household food security. The recommendations refer to effective nutrition education for mothers and other caregivers, as well as agriculture-nutrition linkages to be strengthened, amongst others⁽⁸⁹⁾.

Within the NDP (2012), stunting is discussed only in the context of ECD within the ninth chapter. (Chapter 6 goes no further than a brief mention.) The chapter is titled “Improving education, training and innovation”. It is mentioned that ECD will be of greater quality if the foundation of child nutrition, health and development is strong. It is mentioned that this foundation should be laid in the first three years of a child’s life⁽⁸⁹⁾. It is of concern that neither the term stunting, nor nutrition, appear within the tenth chapter as that chapter deals with health. It does mention “diet” within the context of NCDs, and in a heading to promote healthy diets, without any elaboration on what that entails. Furthermore, the section on NCDs end with the

^J The NDP was drafted by the NPC, a body appointed by the President of South Africa in May 2010. Located in the Presidency and headed by the Minister in the Presidency for National Planning, the NPC is an advisory body. It does not formulate government policy and its recommendations do not bind the President or his Ministers to any particular policy direction. The purpose of the NPC is to draw on expert opinion and consult with stakeholders in order to craft a vision and a set of recommendations that the government may or may not use⁽⁸⁹⁾.

following about the role of the government: “raise awareness about the consequences of diet choices and use a regulatory mechanism to monitor progress”⁽⁸⁹⁾. Given that the majority of the national policy documents that aim to reduce the prevalence of stunting are under direction of the National DoH, this is an unexpected and inexplicable omission in the NDP chapter on health.

2.4 Discussion

In SA, stunting affects one in five children under the age of five, ranking SA as one of the 36 high burden countries in the world. This classification rates those countries with the highest levels of babies born with IUGR, and stunting and underweight among young children on a worldwide level⁽⁹⁰⁾.

Arguing from the perspective that policy is a plan of action, the existence of policy that documents specific strategic goals, regulations, guidelines and programmes, appropriate and informed by evidence, is crucial⁽³⁶⁾. As an overarching guideline, a focus on the 1000 days concept is vital to the successful reduction in the prevalence of stunting. The evidence that this period represents the most significant window of opportunity for nutrition interventions should be used as baseline guiding principle for nutrition policy and intervention planning⁽⁴⁾. In the case of South Africa, the overview in this article of policies that directly and/or indirectly have a bearing on stunting, indicated that policy is informed by evidence and the 1000 days concept is recognised as the period that should receive priority attention. In this regard it can be said that SA policies with a focus on stunting reduction have the correct point of departure.

Currently, the majority of policies relevant to reducing the burden of stunting are housed by the Department of Health. It is very important for future-thinking and development planning to ensure that stunting is comprehensively integrated into national policy (and planning) especially in a document supposedly as extensive as the NDP. Until policy language progresses beyond mentioning integration to actually integrating, setting up frameworks and sharing responsibility, it remains lip service. The South African policies speak of evidence-based interventions and incorporate current global guidelines and strategies, but this is only the first step in the right direction. In order to implement with sufficient success the interventions that relate to reducing the incidence of stunting during the first 1000 days window of opportunity, there is a need for new structures and more high-level political will and leadership, to accelerate the agenda. Without this supportive environment, the future of South Africa and other sub-Saharan African nations achieving this looks bleak.

A recent independent evaluation report on services to children under the age of 5 years in SA, referred to as the Presidency Report ^K compared the RSA with five countries that have shown improvements in nutrition. These are Brazil, Columbia, Mozambique, Malaysia and Malawi. The highlighted characteristics of the responses implemented by these countries are coordination, common operational plans for all the sectors involved, food quality and dietary diversity as a focus, conditional cash transfers and finally common metrics used to track food and nutrition interventions in all sectors⁽⁹¹⁾. The ingredients of these success stories point to a blended approach of nutrition specific and nutrition sensitive interventions, supported by co-ordinated and integrated approaches of these interventions and strong leadership for nutrition action.

Furthermore, the Presidency Report states that South Africa “has a good mix of health and nutrition policies”⁽⁹¹⁾ that have the potential to address nutrition-related issues present in the country. Although South African policy in theory represents, to some extent, the multi-sectoral nature of the fight against stunting and regards the first 1000 day principle as important, there is a lack of coordination between policies from different sectors involved. For example, although the Food and Nutrition Security Policy mentions the need for integration of existing policies, none are mentioned. Another example of the lack of coordination of this matter is clear in the NDP, wherein stunting is not a feature of the chapter on health, it features only in the chapter on education.

Success stories regarding eradicating or significantly reducing the prevalence of stunting are found in many parts of the developing world. In Asia, the number of stunted children was nearly halved (from 190 million to 100 million) for the 1990 to 2010 period⁽⁴⁾. This figure corresponds to the global decrease in prevalence as mentioned in the introduction. In Nepal, for example, a 30% reduction in stunting over ten years was facilitated by large numbers of female community health volunteers in a Ministry of Health programme⁽³⁶⁾. In South America, several ‘stunting reduction’ success stories have also been reported. Documenting changes over two consecutive ten-year periods, in Northeast Brazil, stunting prevalence fell from 34% in 1986 to 6% in 2006, of which the second ten year period represents a reduction to a quarter of its former prevalence^(4,92). The overall reduction in childhood undernutrition prevalence in the first ten-year phase is ascribed to maternal schooling and improved delivery of water and sanitation

^K Referred to as “The Presidency Report” because it was completed at the request of the Department of Performance Monitoring and Evaluation of the Presidency.

services. In the second ten-year period, the increased purchasing power of poor families played an additionally significant part in reducing stunting⁽⁹²⁾. The expectation is that stunting will no longer be of public health relevance in Brazil within the coming decade⁽⁹³⁾. In the same region, Mexico has shown an ongoing reduction in stunting since 1988, accredited to improvements in access to health care, targeting as well as coverage of a conditional cash-transfer programme⁽⁹⁴⁾. These feats show it is possible to reduce stunting at population level. The reasons cited are attributed to a coinciding rise in income and access to education (especially maternal), basic health care, sanitation and clean water among the poor. Moreover, successful integration of nutrition policies across sectors and effective leadership have been shown to result in successful reductions in stunting prevalence⁽⁹¹⁾.

2.5 Conclusion

In future, the problem of childhood stunting may affect fewer individuals and be less of a burden on economic productivity and growth, but in order to achieve this goal in South Africa and the rest of the developing world, much still needs to be done. Regardless of the context, guiding action in the form of policy is a first step towards success. Fortunately, at both a global and national level, there is a move towards coordinated efforts from a range of sectors and disciplines, and this should continue to be reflected in development agendas and goals and the associated policy processes. The overall processes should be inclusive and committed to achieving results that make a sustainable difference.

Chapter 3

3 Strategies to reduce stunting in KwaZulu-Natal, South Africa: the case of the Department of Health's Provincial Nutrition Programme Director

3.1 Introduction

Stunting is a nutritional disorder resulting from a combination of determinants, ranging from the most distal socio-economic and political influences to the immediate level where food, disease and care play a significant role^(16,55). This disorder is a feature of the South African child health status, assessed by the anthropometric indicator length/height-for-age⁽⁹¹⁾. Stunting is, according to the United Nations Children's Fund (UNICEF), diagnosed when a child's height for age is less than minus 2 standard deviations (cases of moderate stunting) and less than minus 3 standard deviations (cases of severe stunting) from the median of the World Health Organization (WHO) Child Growth Standards⁽¹⁷⁾. It manifests most often during the first 1000 days of life (the period from conception to the child's second birthday), a period regularly referred to as the most critical time for nutrition interventions⁽⁹⁵⁾. The effects of stunting are detrimental and can be irreversible⁽¹⁵⁾. These include impaired cognitive function, shorter stature as an adult, lower attained schooling, lower adult earnings, increased risk for developing several non-communicable diseases (NCDs) and an increase in the human and economic burden of communicable diseases (e.g. tuberculosis, malaria and the human immunodeficiency virus and acquired immunodeficiency syndrome (HIV and AIDS))^(11,59,61).

The 2013 Lancet Series on Maternal and Child Nutrition first proposed the 'Framework for actions to achieve optimal foetal and child nutrition and development'⁽¹⁵⁾. This is a guiding structure that could, if applied as suggested, yield significant benefits to individuals, communities and to an entire country. Three parts comprise the framework: firstly nutrition-specific interventions, which focus on food, nutrient intake, parenting and reducing the burden of infectious diseases. Secondly, nutrition-sensitive interventions are described; these have more to do with underlying, rather than direct, determinants of nutrition outcomes e.g. agriculture and early childhood development. The third part is the enabling environment. Gillespie et al. in the 2013 Lancet Series defines the enabling environment as "political and policy processes that build and sustain momentum for the effective implementation of actions

that reduce undernutrition⁽¹²⁾, in other words, what can be done to support the achievement of success, i.e.: optimal foetal and child nutrition and development.

The results of a systematic review by Gillespie and colleagues⁽¹²⁾ of literature and policy processes that focus on nutrition showed that it is possible to create political momentum and sustain it deliberately, instead of waiting for it to develop organically. Furthermore, for this momentum to have an effect on nutrition status, more deliberate action is required in terms of process alignment. The review referred to by the authors⁽¹²⁾ categorised three linked factors that are vital to the translation of momentum into effect, which is described in Box 3-1⁽¹²⁾. The categorisation forms the foundation of the content architecture of what will be argued in this article. These elements include: knowledge and evidence; politics and governance; and capacity and resources.

Box 3-1: Elements of an enabling environment for accelerated undernutrition reduction.
Adapted from Gillespie et al., 2013⁽¹²⁾

<p>Framing, generation, and communication of knowledge and evidence <i>-Issues and challenges to creation and sustaining of momentum</i> Framing and narratives Evidence of outcomes and benefits What works and how well do nutrition interventions work relative to others? Advocacy to increase priority (civil society) Evidence of coverage, scale, and quality <i>-Issues and challenges to conversion of momentum into results</i> Implementation research (what works, why, and how?) Programme evaluation (impact pathways) Generation of demand for evidence of effectiveness</p> <p>Political economy of stakeholders, ideas, and interests <i>-Issues and challenges to creation and sustaining of momentum</i> Incentivising and delivering of horizontal coherence (multi-sectoral coordination) Development of accountability to citizens Enabling and incentivising of positive contributions from the private sector <i>-Issues and challenges to conversion of momentum into results</i> Delivery of vertical coherence The role of civil society and the private sector in delivery</p> <p>Capacity (individual, organisational, systemic) and financial resources <i>-Issues and challenges to creation and sustaining of momentum</i> Leadership and championing Systemic and strategic capacity Making the case for additional resource mobilisation <i>-Issues and challenges to conversion of momentum into results</i> Delivery and operational capacity New forms of resource mobilisation Prioritisation and sequencing of nutrition action Implementation and scale-up</p>

The authors of this paper state that a “clear, overarching priority” is needed for both strategic and operational capacity to be strengthened in order to scale up interventions⁽¹²⁾. It is furthermore necessary to embed nutrition as a consideration across sectors’ actions, as argued for in earlier literature^(96,97). Key to this achievement is long-term investment of resources at national and global levels in building capacity in individuals, organisations and systems⁽¹²⁾.

The question arises: what does an enabling environment look like at implementation level, where momentum should be created and translated into results? Literature strongly shows the

importance of individual's contribution in cases of accelerated reduction of undernutrition^(12,98,99).

However, as highlighted in the nutrition leadership literature, there is a gap in the knowledge of the “attributes of leaders in nutrition”^(96,100). Nisbett and colleagues made a call to identify individuals who act within the wider political economy relevant to nutrition. Upon studying these individuals, who are nutrition leaders in their own right, the authors made the following classification of individuals involved: a) decision makers, b) influencers and c) clients. Furthermore, when individuals are also advocating specific changes, they can be identified as nutrition champions (from decision makers), policy entrepreneurs (from influencers) and supporters (from clients)⁽¹⁰⁰⁾.

This research is a response to the call to identify nutrition leaders and describe their work. The objective is to sketch the profile and leadership approach of the director of a nutrition programme at the provincial government level in South Africa. Although the literature focuses on country level data, this article will argue that the provincial programme director is a noteworthy case to add to the understanding of “how leadership operates”⁽¹⁰⁰⁾.

3.2 Design

The objective of this article is to show the positive trend in reducing the burden of stunting and undernutrition in general in KwaZulu-Natal (KZN), a province in the Republic of South Africa. As part of the explanation for this trend, this article will argue for the contribution by the Director of the nutrition programme within the provincial Department of Health (DoH), and her place, within the enabling environment as a leader and an advocate for nutrition, in the wider provincial government context.

The principal means of gaining a detailed understanding of the trend was a semi-structured interview with the Director of Nutrition in KZN. Ethical clearance for this research was obtained from the KZN DoH Provincial Health Research & Ethics Committee as well as the Research Ethics Committee: Humanoria, Stellenbosch University (Reference DESC-Muller/2014). The interview followed a semi-structured format to allow for a natural development of the conversation. This qualitative approach allowed the interviewer to frame questions during the interview⁽³⁸⁾ as well as flexibility to the interview when the aim is to discover those parts of the implementation process to which a mere review of policy and

programmatic documents may be blind. In order to achieve this it is important to remain non-directive as far as possible.

The interview discussion guide questions were not made available to the participant before the interview. The questions guiding the semi-structured interview were developed from the objectives of the study, grounded in the elements in Box 3-1, featured in the introduction, and divided into 5 themes: priority-setting, policy and politics; coordination; capacity and leadership; monitoring and evaluation; and management. An expert in the field of political economy and food systems reviewed the discussion guide. The guide was adapted according to input received.

The interview was audio recorded and transcribed by the researcher. Transcriptions were read several times to identify common themes and data were manually coded into units of meaning.

The information obtained (raw data) through the interview was valuable as the enabling environment at implementation level is under-documented. The aim was to illustrate a golden thread between the gathered information, the analysis through interpretation and identifying trends⁽³⁸⁾. In this case the researcher intended to understand the world of human experience in practice and the analytical process can therefore be referred to as “interpretative content analysis”.

In addition to content analysis, word clouds were used as a tool for preliminary indication of prominent words used. In order to aid the process of identifying recurring words, word clouds were created per theme and for the introduction and final unstructured part of the interview. Wordle, developed by Jonathan Feinberg, is a free web tool that highlights words used frequently in a text by creating word clouds, or data visualisations⁽¹⁰¹⁾. Unedited transcripts were used to develop the word clouds, with questions removed. Only the top 75 words were used for each theme or section of the interview, resulting in a total of 7 clouds, one is featured in this article. The Wordle algorithm removes commonly used English words, and so this must be taken into consideration in the interpretation of the clouds. The researcher is furthermore responsible for identifying words that are synonyms or different forms of the same word and contextualising these occurrences. Literature about using word clouds as an analytical tool caution against solely relying on it, and suggest using traditional analyses also⁽¹⁰²⁾, as was done for this research.

This primary source (i.e. interview) is discussed within the context of descriptions of the KZN trend with current data and reports in the form of two publications. The first report is the country's most recent national "comprehensive health and nutrition study", the South African National Health and Nutrition Examination Survey (SANHANES-1)⁽⁸⁰⁾. Data reported in this document is the most current for the study area.

The second document is referred to as "the Presidency report", due to the origin of the report. Formally titled "Diagnostic / Implementation Evaluation of Nutrition Interventions for Children from Conception to Age 5", the summary evaluation report was completed by an independent consultancy, Khulisa Management Services, at the behest of the Department of Performance Monitoring and Evaluation in the Presidency. It was approved by cabinet in April 2015, following its completion in March 2014. This evaluation assessed the implementation of 18 nutrition interventions delivered by the national departments of Health (DoH), Social Development (DSD) and Agriculture, Forestry and Fisheries (DAFF), focusing on the sufficiency of policy, leadership, resource allocation, management and service delivery in the country, with case studies from four provinces in the country, one being KZN⁽⁹¹⁾.

3.3 Setting

3.3.1 Political economy

KZN, one of nine South African provinces, has a population of approximately 10.69 million people, which is 19.8% of the South African population⁽⁷⁶⁾. Politically, it is governed by the African National Congress. The party currently (2015) holds a 64.52% majority in the provincial legislature. The current Premier has been in office since 2013⁽¹⁰³⁾. Under the leadership of the Premier of KZN, several projects have been prioritised to address the inter-related complexities of poverty and deprivation in a multi-sectoral community-based development approach. These projects include the Provincial Growth and Development Plan (PGDP), which was produced by the KZN Planning Commission to enable the province to measure growth and development goals⁽¹⁰⁴⁾. Operation Sukuma Sakhe (OSS), the provincial "war on poverty" approach and flagship programme, was originally launched in 2008 and re-branded in 2011. It focuses on community partnerships, behaviour change, and integration of government services, economic activities and environmental care. Another project is the KZN Poverty Eradication Master Plan, which was adapted in 2015, as a multi-pronged plan for eradicating poverty and creating dignity for KZN inhabitants. It should be read as actionable interventions based on the PGDP⁽¹⁰⁵⁾.

3.3.2 Burden of disease

The Human Immunodeficiency Virus is a significant feature of the provincial public health status, with 15.8% of the population identified as People Living with HIV⁽¹⁰⁶⁾. The highest recorded rates of HIV amongst women who attend antenatal clinics in South Africa is found in KZN⁽¹⁰⁷⁾.

Child undernutrition has historically been prevalent. For stunting in children aged 12-71 months, a comparison of the 1995 South African Vitamin A Consultative Group results with those of the 1999 National Food Consumption Survey showed an increase in prevalence (approx. 15% to 23%)⁽¹⁰⁸⁾. The comparison of the prevalence of stunting in children aged one to nine years between the 1999 and 2005 data show a reduction from 18% to 15%⁽¹⁰⁹⁾, the first “turn of the tide” although the age group is wider than the focus here. More recently, the reducing trend of stunting is continuing; the “child under 5 severe acute malnutrition case fatality rate” has fallen between 2010 and 2014 from 12.1% to 9.7%⁽¹¹⁰⁾. SANHANES-1 reports that for the period of the investigation the prevalence of childhood undernutrition in KZN is the lowest in South Africa, along with Gauteng, although it coincides with the highest levels of childhood obesity⁽⁸⁰⁾.

Given the status quo, the KZN provincial DoH has established several strategic goals to maintain a trend of improving primary health care. The Provincial DoH Strategic Plan for 2015-2019 has the following mission: “To develop and implement a sustainable, coordinated, integrated and comprehensive health system at all levels, based on the Primary Health Care approach through the District Health System, to ensure universal access to health care”⁽¹¹⁰⁾. The same document shows eight programmes aimed at achieving this mission, and mentions the DoH’s five strategic goals, found in the 2015 Annual Performance Plan, depicted in Box 3-2 **Error! Reference source not found.**. Specifically relevant to this article is the second goal: reduce the burden of disease”. In its description the incidence reduction of severe acute malnutrition in children under five years old to 4.6 per 1000 children is a goal to be reached by March 2020⁽¹¹⁰⁾.

Box 3-2: Provincial strategic goals, KZN DoH⁽¹¹¹⁾

- | | |
|----|--|
| 1. | Strengthen health system effectiveness |
| 2. | Reduce the burden of disease |
| 3. | Universal health coverage |
| 4. | Strengthen human resources for health |
| 5. | Improved quality of healthcare |

SANHANES-1, (Table 3-1Table 3-1), has the following data about stunting in South Africa: the age group 0-3 years is most diagnosed with stunting for both boys (26.9%) and girls (25.9%)⁽⁸⁰⁾, which is concerning in the context of the first 1000 days concept⁽⁹⁵⁾. For boys, the locality with the highest stunting prevalence is rural informal, and for girls, urban informal.

According to the results of SANHANES-1, KZN (see row highlighted with italics) performed well against other provinces. KZN has the second lowest prevalence of stunting in boys and the fifth lowest prevalence of stunting in girls. Prevalence of severe cases of stunting was the lowest for both boys and girls in KZN.

Table 3-1: SANHANES-1 results for stunting prevalence in boys and girls in South Africa⁽⁸⁰⁾

	Boys		Girls	
	% Below -2 SD Moderate	% Below -3 SD Severe	% Below -2 SD Moderate	% Below -3 SD Severe
Age				
0-3	26.9	9.9	25.9	9.1
4-6	13.5	2.6	9.5	1.6
7-9	10.0	1.5	8.7	1.9
10-14	15.2	1.8	10.1	1.7
Locality				
Urban formal	13.6	3.1	10.4	3.2
Urban informal	17.6	3.5	20.9	4.5
Rural formal	18.4	4.3	13.9	3.1
Rural informal	23.2	7.1	17.0	6.2
Province				
KZN	13.5	1.8	14.4	1.2
Western Cape	17.5	3.8	13.9	3.0
Eastern Cape	21.6	4.0	15.6	4.0
Northern Cape	22.8	8.7	15.0	3.9
Free State	19.4	3.2	22.1	6.5
North West	23.7	9.7	17.8	6.5
Gauteng	11.9	2.9	10.0	5.1
Mpumalanga	23.1	7.3	13.0	4.2
Limpopo	13.7	3.0	9.4	2.3

The Presidency report provides detailed recommendations based on the findings of the evaluation. Box 3-3 features the recommendations to be implemented nationally as suggested by The Presidency report from the KZN case in particular. It is clear from these

recommendations that the independent report recognised KZN as an example of success in addressing nutrition issues in South Africa.

Box 3-3: Key recommendations based on KZN case featured in The Presidency Report⁽⁹¹⁾

1. Nutrition should have a higher status, and to facilitate this, nutrition directorates should be established across all provinces.
2. Commitment at the highest level as in KZN should be duplicated in other provinces.
3. KZN has an explicit vision and leadership for nutrition, this is supported with inter-departmental coordination.
4. Across sectors, nutrition intervention personnel should be trained better, as was done with nurses in KZN through the University of KZN.
5. Community-based mechanisms should be rolled out as they are effective.
6. Integration is important, OSS is a good example from KZN.
7. At clinic level, nutrition advisors should be appointed, as well as nutrition-trained community health workers (CHWs).
8. CHWs and community caregivers (CCGs) are effective for intervention success, even with a range of skills required.
9. A coordinating framework in which nutrition features prominently is valuable, citing OSS run from the Premier's office in KZN.
10. KZN collects more indicators than any province, as well as the national DoH.
11. The relationship between the DoH and the University of KZN is worth mention as an illustration of partnership between academic institutions and government, especially in terms of staff development.

3.4 KwaZulu-Natal Director: Nutrition Programme

An interview with Ms Lenore Spies (referred to as LS or “the participant”), the director of the Nutrition Programme in the KZN DoH, was held in Cape Town in September 2014. It is important to mention that KZN is the only province in South Africa where the head of the nutrition office within the DoH is on director-level. In all eight other provinces the highest position of the specific office is at Deputy Director level in the Nutrition Sub-Directorate. Ms Spies has held this position since June 2012. The staff structure of the Directorate (both the Directorate Office and Field Staff) is shown in two figures. The Nutrition Coordinators at the top of the pyramid in Figure 3-2 are employed at the same level as Assistant Directors in Figure 3-1.

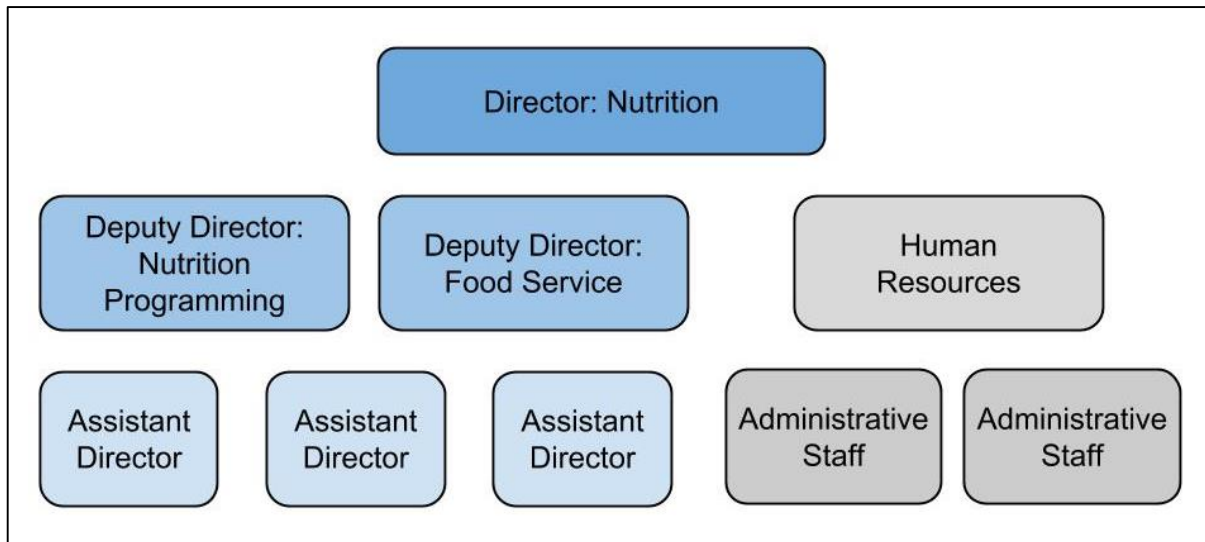


Figure 3-1: Organogram of Directorate: Nutrition, KZN DoH

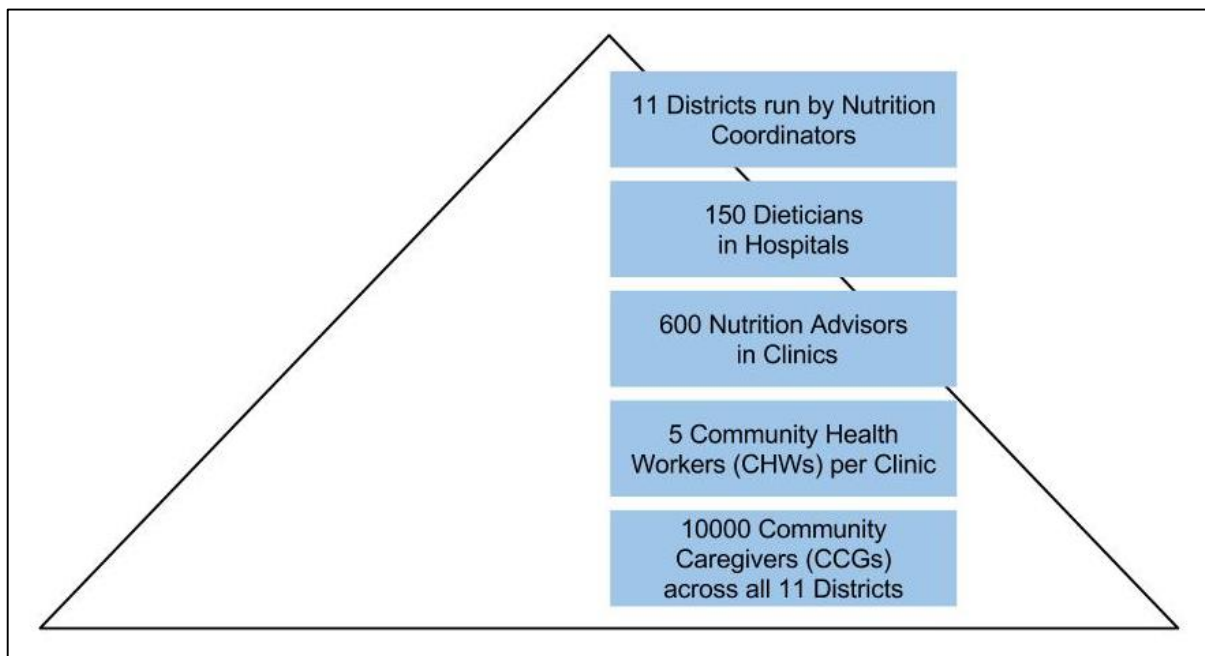


Figure 3-2: Field staff, Directorate Nutrition, KZN DoH

The theme of the interview was framed to determine how the enabling environment for nutrition interventions was established in the nutrition public sector programme in KZN.

3.4.1 Introduction to the interview

The introduction section of the interview commenced with questions about background, career path, motivation and passion for nutrition and personal leadership style. The responses of Ms Spies went beyond these questions to contextualise her work and the success of the Nutrition Programme.

LS is a qualified dietitian who trained at the University of Natal, (now the University of KwaZulu Natal). She was one of the first black (African) dietitians to qualify in South Africa and needed special permission from the Minister of Interior at the time, to register at the then-predominately white university. She described the process of obtaining this special allowance as an important motivator to make a difference in the world, as well as coming from an era of transition, reform and the struggle for democracy. If she did not make it worth the effort, she said she “*should have just gone to the bush college where they [the apartheid government] wanted you to go.*” She identifies herself as someone with a sense of patriotism, commitment to the country and desire to make a difference by contributing at a larger scale than private practice patients permits. Her interest has developed over time to population-level interventions. Her training from a ‘white’ university later meant that her qualification was of such a standard that she “*could go anywhere*”, in other words, she felt it afforded her access to a career typically not accessible to black individuals under apartheid. Her career has always been in the public sector, with past appointments in the KZN and Western Cape provincial DoH. At the middle of her career she decided to pursue registration as a nutritionist, leading to application for dual registration as a nutritionist in addition to her registration as dietitian with the Health Professions Council of South Africa.

LS stated that the passion for her work is fuelled by her willingness and desire to make a difference. Her narrative can be interpreted as having a strong sense of responsibility, stating “*if you don’t do it, who is going to do it?*” She is also passionate about and advocates for broadening the perception of what dietitians do. Passion for nutrition arising from the desire to make a contribution is a trait she looks for in her staff. This is considered an internal motivator that requires little additional motivation or inspiration from her.

3.4.2 Leadership

LS defines leadership as “*moving the boundaries*” and “*innovation and creation*”. She states that she is willing to try new things, but also to get feedback if her plan is not working or the incorrect approach. She does not see herself as a researcher, not caring about publications and being “*statistically significant*”. Although not self-identifying as a researcher, she does read the latest public health nutrition publications and mines these for ideas that she can translate to the KZN context. There is a strong sense of confidence in her own ability to see what would work and what not, and knowing her context well. From her narrative it is clear that she regards action

as the most important aspect of her work, placing value on the lives she's saved and the difference she has made.

Another important facet of her leadership style is relationship building and advocacy, and these skills are self-taught, not forming part of her university training. She perceives the technical knowledge she possesses as less important to decision-makers she reports to or works with. The skill of learning and knowing people has been a personal priority in order to have influence with decision-makers and the "*big people that matter*", to "*sell[ing] them the malnutrition and the death*" (death here is meant as the reality of untreated malnutrition, i.e. the hard reality that mismanaging the nutrition programme can lead to death of young children). The goal is for nutrition to "*sell itself*". In order to achieve this, LS frequently refers to the chicken or egg analogy. This is a recurring explanation for the success of reducing malnutrition in KZN, in that: once an intervention is implemented that yields results, particularly when its benefits gain public interest, it becomes easier to gain approval for other interventions, which in turn creates more results and so the cycle continues.

Using the word cloud as a tool shows that besides 'nutrition', the overall theme of the discussion, 'province' and 'people' are significant terms. Firstly, the participant takes significant ownership when talking about KZN, often saying "*my province*". Wordle removes 'my' as a common English word so this is lost in the cloud. The significance of "*my province*" was apparent to the researcher during initial reflection directly following the interview. Not only does LS take ownership of the province and the work she does, but this can be interpreted as part of her attitude towards working in the public sector and for the greater good. She takes pride in her decisions to work in public health; this is part of her concept of self-worth. LS is originally from KZN - "*born and bred*". These statements can also be seen as loyalty to her roots. Secondly, the frequency of "*people*" points to relationships (mentioned above) she has fostered during her career to facilitate her work and includes: exposure to people, those in positions without whose support, projects cannot be implemented and the patients treated through the nutrition programme.

3.4.3 Nutrition as a priority

“I, as a health professional, feel that if we really just get the exclusive breastfeeding thing right, we will have dealt with so many other issues”

According to LS, the focus on and prioritisation of nutrition in KZN is symbolic of the value placed on nutrition as part of the province’s strategy to alleviate poverty. As she is a director, she is able to give nutrition more exposure at a higher level. Getting approval for interventions or policies is also easier, since there are fewer levels of hierarchy with which to engage. She also feels that the application of her knowledge is valued, and that she has the scope to do bigger projects. It is obvious from her answers that she considers KZN to be superior, specifically to the Western Cape (a province often regarded as being more resource rich in comparison to other provinces), with reference to the President’s report recommendation that other provinces need to benchmark the nutrition programmes to KZN.

LS stated that priority-setting is directed by the national policy. The national policy is seen as a guideline, with operationalisation and implementation decided on at the provincial level. Data from the District Health Information System (DHIS) was described as important to inform the implementation of interventions. Interestingly, the response to this question made it seem like priority-setting is not wholly in the provincial directorate’s hands. Later in the interview it became clear that the priority was explicit for a single message: breastfeeding, and that the decision to advocate and implement this was made independently from national policy.

LS considers the 2 year period (starting in 2007) dedicated to advocacy as the catalyst for changing the malnutrition situation in KZN. The decision to prioritise exclusive breastfeeding (EBF) in KZN was made before the Tshwane Declaration (2011) pledged support for breastfeeding in SA. This shows that her insight into priorities was ahead of the curve. LS explains the process of making EBF a priority as a chance for nutrition to make a contribution. During the “height” of the HIV pandemic in South Africa, which had its centre in KZN, LS realised that even though antiretroviral therapy for children was preventing death by HIV/AIDS, they were still dying of other causes. Fifty percent (50%) of the deaths were linked to malnutrition and formula feeding (at the time a common feeding practice) was not adequately addressing malnutrition. KZN was the first province in South Africa to cease the use of formula feeding as part of the Prevention of Mother-to-Child Transmission programme. The advocacy process to change the practice to EBF happened at multiple levels including directly

communicating the message to mothers: “*every mother had to understand that she had to breastfeed*”, in addition to talking to clinicians, programme managers, politicians and DoH management figures. Commitment to the intervention is important, as was articulated by the following statement: “*everybody has to be focused on this same thing all at once, and there must be no weak links in the system*”.

Translating priorities into policy is perceived as an easy task by LS, that it is a particular skill and expertise of the directorate staff. The high rate of government endorsement of policies results in broad-based implementation and accountability across health cadres. Although the policy development process is completed by LS and her team, she takes pride in knowing that once implementation starts, the ownership of the policy shifts to the wider healthcare community. Achieving this is a sign of success to LS.

3.4.4 Commitment to nutrition

Commitment was described as an important driver of change at two levels: politically in the province and within the DoH staff component. Political commitment was described as high^L. Even though the current premier does not have a background in healthcare, LS describes the political commitment in the province to nutrition outcomes as entrenched, with established structures. This translates into accountability of the directorate at the highest level of government in KZN. Elaboration of how malnutrition is an entrenched, perhaps even institutionalised priority, the statement “*everybody in the Premier’s office now knows of malnutrition*” was offered. She considers that the advocacy she has been driving for years has paid off, as malnutrition is placed on the agenda even when healthcare representatives are absent from high-level meetings.

Of the directorate staff members and in the workforce she manages, LS has high standards of commitment. She holds her staff accountable to the results they produce in terms of malnutrition management and reduction. LS views her staff to be as accountable to higher levels of management as she is. It is clear, not only from her explicitly saying so, that she runs a “*tight ship*”. This can be interpreted as a result of the image of the directorate: there is a track record of success, fewer deaths and better indicator scores.

^L Context: the previous premier, a medical doctor, was the provincial minister of health before his term as premier.

3.4.5 Monitoring and evaluation

In Figure 3-3, the word cloud produced from the discussion on monitoring and evaluation is depicted. Per clarification, ‘know’, which features mostly due to the use of ‘you know’ as an interjection or filler, should not be read as an indication of ‘knowledge’ per se^M. The words that stand out in this word cloud are ‘training’, ‘indicators’, ‘numbers’, ‘data’ and ‘DHIS’.

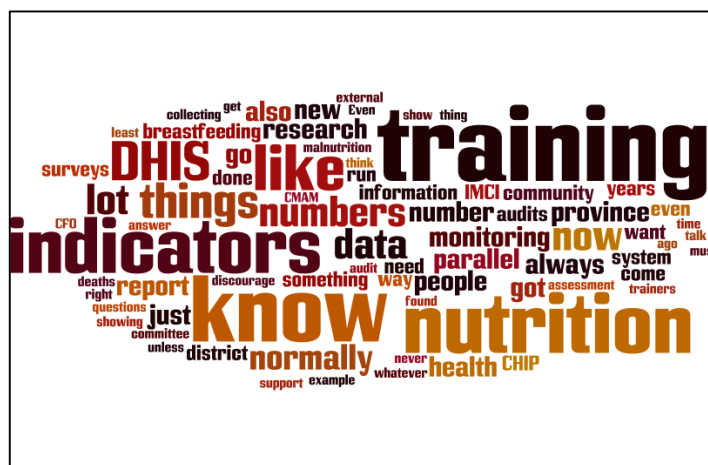


Figure 3-3: Word cloud for discussion of monitoring and evaluation

LS stated that she has developed a personal interest in monitoring and evaluation. From her discourse it is clear that this is a powerful tool in her approach to advocating for nutrition. She frequently describes its use in her relationship with decision-makers, particularly the Chief Financial Officer of the provincial DoH, and the Head of Department (HOD), even stating “*the only way I can talk to the HOD is if I can show her the number came down*”. Reporting intervention success based on indicators is an important component of advocacy, according to LS. The collection of data through indicator reports is chiefly conducted by nurses. Training nurses is not usually nutrition-specific, but rather forms part of an integrated approach. It is in this context where ‘training’ should be positioned: given the stated weight assigned to monitoring and evaluation, training relevant staff is key to maintaining good data. When non-DoH projects are implemented and studied in KZN, the directorate uses the opportunity to verify the data they collect. Leveraging these opportunities to include at least a small component of nutrition is also part of the strategy from the Nutrition directorate. The track record of successful interventions documented through monitoring and evaluation is another example of the chicken or egg analogy used by LS, as mentioned earlier.

^M This is a common feature of the subject’s speaking style.

3.4.6 Partnerships

The path to outside partnerships of varying scale with, for example the WHO, the Global Alliance for Improved Nutrition (GAIN)^N, ELMA Philanthropies^O, is streamlined through documented success of interventions. This is also the case for external sources of funding, which supplement the provincial budget. Rather than small-scale local projects, LS posits that the province is directly contacted by funders to establish relationships with funders and set up funding agreements. Building relationships and fundraising is controlled by the directorate with a strict policy and timeframe. Industry seems to know the system used by the directorate and the nutrition staff are equally given opportunities to, for example, benefit from appropriate sponsorship to access further training. This approach to managing funders is followed to avoid companies forming personal relationships with dietitians. It can also be interpreted that a centralised system is favoured to maintain coherence in the strategies followed by the directorate, where LS has the biggest influence.

3.5 Discussion and Conclusion

The nutrition programme director position that LS holds is the highest position for nutrition in provincial government in South Africa. In all other provinces, nutrition is represented at a deputy director level. The influence that this higher position affords is identified by LS as of great importance for advocacy and political commitment. Creating this position in all 8 other provinces is a recommendation of the Presidency report and indirectly supported in the literature, where access to decision-makers is lauded as critical⁽⁹⁶⁾. Leveraging good data in the position of influence is a key combination of factors in the success of interventions in KZN. Advocacy is heralded as particularly important in the KZN case as described by LS. The fiscal commitment made to nutrition by the KZN Treasury was not discussed by LS in any detail. Investigating trends in government expenditure on the nutrition programme would add very important information to the total picture of the programme's successes. It is assumed that there has been a financial match to the political will described in the previous section.

Nutrition champions, defined as organisations and individuals who, at various levels, consistently strive to accelerate improvements in nutrition outcomes, are vital role players in

^N GAIN is an international organisation founded in 2002 by the United Nations to focus on the human suffering connected to malnutrition.

^O ELMA Philanthropies is the services branch of the ELMA Group of Foundations, which provides philanthropic assistance (grants) to high impact initiatives.

achieving success⁽⁹⁾. Leaders in public health nutrition face many challenges and therefore networking and collaboration is called for by researchers^(112,113). The call for leadership is clear.

In this article an example of an individual driving momentum for sustained results of undernutrition reduction has been shown. This leader has a clear vision and has selected to prioritise a single message: to bring all mothers to the understanding that they must breastfeed exclusively for the first 6 months of the baby's life. The importance of EBF has been advocated widely, and a cycle of positive reinforcement has resulted. This 'single message' advocacy approach was described in the literature as "more effective if the advocate has a clear set of actions to recommend"⁽⁹⁶⁾. This one message approach, together with the management style and leadership provided by LS has had a positive effect on the success of the implementation of the provincial Nutrition Programme in KZN. This case is an example that policy with focussed implementation bears fruit. In other words, deliberate creation of political momentum, strategic action and the importance of individual and systemic capacity (which make up the enabling environment) to support optimal nutrition and development are vital parts of the solution to the nutrition problems.

In conclusion, given the many elements of the enabling environment, an individual capable of operating across different political economy levels, framing nutrition problems and communicating it effectively, and building and utilising capacity is to be valued and learned from. Every context is different and calls for its own leadership style, but the broad indicators for action and resultant successful outcomes aimed for should be similar. KZN has, in a sense, had the benefit of the right stakeholders engaging and committing at the right time, and can be used as a model for other contexts. Certainly the government of South Africa should pay special attention to the KZN model to change the tide of, amongst other, nutrition indicators for persistent high levels of stunting in children under five as a key development priority.

Chapter 4

4 Overall discussion and conclusion

The nutrition disorder stunting is severe and the consequences can last a lifetime. Evidence shows that its prevalence can be reduced significantly through a range of interventions. The long-term goal of complete eradication should be worked towards in a tireless way to ensure that both individuals' and nations' development potential can be reached. Upon summarising significant global guidelines for nutrition interventions, this thesis has unpacked documented strategies to reduce stunting in South Africa. This was prefaced by a preliminary overview of such strategies in other sub-Saharan African countries to provide context. Additionally, an investigation of the leadership and management provided by the Director of the KwaZulu-Natal Department of Health: Nutrition Programme, was explored. The intention thereof was to contribute to the emerging field of documenting such specific examples of the enabling environment 'in action' that occur at the level of implementation of intervention strategies.

4.1 The main research questions

This thesis set out to answer the following research questions:

Main research question:

'What are the strategies in place to reduce the prevalence of stunting in South Africa?'

A follow-on question was formulated as follows:

'What can an investigation of the particular approach followed in KwaZulu-Natal add to the understanding of interventions to address stunting at provincial level in South Africa?'

The thesis was arranged into two free-standing articles with the following specific focus and questions:

Article 1

'To what extent is stunting in young children a feature in South Africa and which strategies are in place to reduce the prevalence thereof?'

Article 2

'What contribution towards reducing the prevalence of stunting in KwaZulu-Natal has been made by the provincial Department of Health's Director: Nutrition Programme?' and

‘What are the key features of the leadership approach towards effective nutrition service delivery and advocacy?’

4.2 Summary of responses to research questions

4.2.1 Article 1

This article highlighted that a multi-sectoral approach to reducing the prevalence of stunting is the most prudent. Leadership is important in facilitating the success of policy to avoid the planned actions becoming powerless. Global guidelines and frameworks provide a good foundation from which nations can develop policies and structure interventions.

Stunting in South Africa is measuring at 21,5% of children under five, with the highest prevalence found in children under the age of three⁽⁸⁰⁾. Given the importance of the first 1000 days, this is a situation requiring urgent remedy.

Although South African policy in theory represents, to some extent, the multi-sectoral nature of the fight against stunting and regards the first 1000 days principle as important, there is a lack of coordination. One example of the lack of coordination is found in the National Development Plan, wherein stunting is not a feature of the chapter on health, rather it features in the chapter on education only. This is of concern as the responsibility for reducing the burden of stunting should be a joint venture between the Department of Health and Department of Basic Education. It is very important for future-thinking and development planning to make sure stunting is comprehensively integrated into policy and plans, especially one of the supposed extent of the National Development Plan.

4.2.2 Article 2

This article revealed that the Director of Nutrition in KZN making key decisions at the right time and identifying opportunities initially laid the foundation for the nutrition programme’s success. Access to high-level decision-making processes seems to be central to programmatic success. This finding has great practical potential as it should be re-created in other provinces in South Africa, as recommended by the President’s Report⁽⁹¹⁾.

Emerging as an important finding, advocacy (across platforms and fora) has been identified by the director as one of the key methods to secure commitment to reducing undernutrition. Therefore the tools detailing the method should also be strongly considered when implementing the KZN approach elsewhere. These tools include a single message approach, consistently

emphasising the benefits of monitoring and evaluation as well as key relationships maintained across sectors.

Nutrition champions, individuals who consistently strive to accelerate improvements in nutrition outcomes⁽¹²⁾, are vital role players in achieving success. Strengthening the enabling environment for nutrition interventions should nurture individuals who show promise of becoming nutrition champions, or hold other important positions such as policy entrepreneurs and supporters⁽¹⁰⁰⁾.

4.3 Limitations and recommendations for future research

The scope of the two article style limits the length and can weaken the depth to which several concepts are covered and primary research can be completed. Nevertheless, the appeal of writing in this format includes the following factors. Firstly, shorter texts are more approachable than traditional thesis documents. This relates both to gaining access to research as the format is more suited to submission for publication immediately following (or during) the research timeline, and, secondly, the intended audience of this research is wider than academia. The goal would be that the research would be applicable to individuals in nutrition sectors and positions that work toward reducing the burden of stunting in communities.

The research reported in this thesis has taken many unexpected and unavoidable changes since the original proposal was written in December 2013. The publication of the Presidency Report in March 2015 was perhaps the single biggest challenge the researcher faced. The objective of that report was broadly the original intention of aspects of the first article for this thesis. The access the authors of the Presidency report were afforded by virtue of the office from which the report was mandated was impossible to achieve by a Master's level student. The aim of the research therefore had to be adapted. By remaining focused on stunting as the sole nutritional disorder this study covered, as well as including the National Development Plan as a key policy and strategy source, the originality of article one was maintained.

As mentioned briefly in chapter 1, the availability of national nutrition policies of countries across sub-Saharan Africa was limited. When available in the public domain (i.e. on government websites or via the SUN network), documents were often outdated or not in English. This was particularly true of Western and Middle African countries considered for study. As South Africa was already highlighted as the selected country from Southern Africa,

other countries from the region were not considered. Also, population sizes of the other Southern African countries are not within comparable range with South Africa.

Based on the data represented in the report following SANHANES-1, other provinces in South Africa have also reduced the prevalence of stunting over time⁽⁸⁰⁾. It would be very interesting to broaden the scope of the research to include exploring the approaches followed by the relevant managers in those provinces in studying the pathways to eradicating stunting in South Africa. Every context could yield a different answer to the question of what an individual contributes, and analysing the similarities and differences would significantly add to the understanding of the level of implementation and mix of successful interventions within South Africa. It is a limitation of this research that only one provincial leadership approach was investigated. The decision to study only KZN was lead chiefly by the focus of the President's report on the KZN success, as well as earlier positive anecdotal evidence and self-reporting from the Directorate Nutrition: KZN.

Given the gap in the literature about 'what an enabling environment looks like', i.e. details at the level of implementation, writing about specific cases of leadership for nutrition is an emerging field. The approach followed in the second article was therefore not founded on established precedent.

4.4 Chapter summary

In South Africa, stunting remains a significant feature of children's nutritional status with implications for individuals and the country as a whole. Although countries with a similar profile in other parts of the world have been more successful at reducing the prevalence of stunting, an investigation of the strategies in place in South Africa shows that there is a lack of coordination between relevant sectors, at least at the national level. Although not the only province in the country to reduce the prevalence of stunting, KwaZulu-Natal has been highlighted as a special case in a recent nationwide evaluation of nutrition interventions⁽⁹¹⁾. In KwaZulu-Natal, efforts to reduce poverty and its determinants (of which nutrition has been identified and championed as an important factor) are centrally organised (i.e. better multi-sectoral coordination). The director of the nutrition programme of the Provincial Department of Health aligns programme goals with the overarching provincial projects. The case of KwaZulu-Natal enhances our understanding of high-level leadership, commitment and coordination as key to effective implementation of nutrition interventions, service delivery and advocacy.

In other provinces in South Africa, the practical implications of this research start with a comprehensive process of advocating nutrition as a driver for sustainable development at the provincial government level. The Office of the Premier has been shown to be a central and politically effective locus for comprehensive and coordinated action against poverty. With a firm grasp of the complex nature of poverty, the next phase would be to position nutrition as a determinant thereof. This causality should be painted in a light of solution, in other words, highlighting adequate nutrition and specifically the reduced prevalence of stunting as a pathway to reduced poverty. This thinking can galvanise support and commitment to nutrition as part of the holistic goal of achieving sustainable development.

Forward-looking sustainability thinking is a holistic approach to observing and interacting with the world, as it sees the attainment of sustainable communities through connection and interdependence. This forms the bottom line of the embedded model of sustainable development, which places the economic dimension within the societal, which is embedded within the environmental dimension. This model positions human development as central but not superior to planetary boundaries. The core argument of this thesis has been developed from the belief and understanding that human development with persistently high levels of stunting prevalence cannot be sustainable. As long as stunting threatens and inhibits individual freedom and because of its wide reach into communities and nations, the attainment of sustainable development remains a distant promise. Fortunately there is reason to be hopeful – individuals have power, and can make a difference regardless of their sphere of influence.

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Addenda

1 Addendum A

Directions to Contributors

Public Health Nutrition

(Revised August 2014)

Public Health Nutrition (PHN) provides an international, peer-reviewed forum for the publication and dissemination of research with a specific focus on nutrition-related public health. The Journal publishes original and commissioned articles, high quality meta-analyses and reviews, commentaries and discussion papers for debate, as well as special issues. It also seeks to identify and publish special supplements on major topics of interest to readers.

SCOPE

The scope of *Public Health Nutrition* includes multi-level determinants of dietary intake and patterns, anthropometry, food systems, and their effects on health-related outcomes. We welcome papers that:

- Address **monitoring and surveillance** of nutritional status and nutritional environments in communities or populations at risk
- Identify and analyse behavioral, sociocultural, economic, political, and environmental **determinants of nutrition-related public health**
- Develop **methodology** needed for assessment and monitoring
- Inform efforts to improve **communication of nutrition-related information**
- **Build workforce capacity** for effective public health nutrition action
- Evaluate or discuss the effectiveness of **food and nutrition policies**
- Describe the development, implementation, and evaluation of **innovative interventions and programs** to address nutrition-related problems
- Relate diet and nutrition to **sustainability** of the environment and food systems

Papers that do not fall within the scope as described above may be directed to more appropriate journals. We prefer papers that are innovative (do not repeat research already undertaken elsewhere) and relevant to an international readership.

ARTICLE TYPES

PHN publishes Research Articles, Short Communications, Review Articles, Letters to the Editors, Commentaries and Editorials. Research Articles, Short Communications and Review Articles should be submitted to <http://mc.manuscriptcentral.com/phnutr>. Please contact the Editorial Office on phn.edoffice@cambridge.org regarding any other types of submission.

A typical paper should be no more than 5000 words long, not including the abstract, references, tables, figures and acknowledgements. Papers submitted as Short Communications should consist of no more than 2000 words, plus a maximum of 3 tables OR figures.

For systematic reviews and meta-analyses, the journal endorses the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement (see British Medical Journal (2009) 339, b2535). Such submissions should follow the PRISMA guidelines.

Letters or commentaries are welcome that discuss, criticise or develop themes put forward in papers published in PHN or that deal with matters relevant to it. They should not be used as a means of publishing new work. Acceptance will be at the discretion of the Editorial Board, and editorial changes may be required. Wherever possible, letters from responding authors will be included in the same issue.

SUBMISSION AND REVIEW PROCESS

PHN uses ScholarOne Manuscripts for online submission and peer review. As part of the online submission process, authors are asked to affirm that the submission represents original work that has not been published previously; that it is not currently being considered by another journal; and that each author has seen and approved the contents of the submitted manuscript.

At submission, authors must nominate at least four potential referees who may be asked by the Editorial Board to help review the work. PHN uses a double-blind review process, and manuscripts are normally reviewed by two external peer reviewers and a member of the Editorial Board.

Revisions must be resubmitted within 2 months or they will be deemed a new paper. When substantial revisions are required after review, authors are normally given the opportunity to do this once only; the need for any further changes should reflect only minor issues.

PUBLISHING ETHICS

PHN adheres to the Committee on Publication Ethics (COPE) guidelines on research and publications ethics. The Journal considers all manuscripts on the strict condition that:

- 1) The manuscript is your own original work, and does not duplicate any previously published work;
- 2) The manuscript has been submitted only to the journal - it is not under consideration or peer review or accepted for publication or in press or published elsewhere;
- 3) All listed authors know of and agree to the manuscript being submitted to the journal; and
- 4) The manuscript contains nothing abusive, defamatory, fraudulent, illegal, libellous, or obscene.

Text taken directly or closely paraphrased from earlier published work that has not been acknowledged or referenced will be considered plagiarism. Submitted manuscripts in which such text is identified will be withdrawn from the editorial process. Any concerns raised about possible plagiarism or other violations of ethical guidelines in an article submitted to or published in PHN will be investigated fully and dealt with in accordance with the COPE guidelines.

DETAILED MANUSCRIPT PREPARATION INSTRUCTIONS

Language

Papers submitted for publication must be written in English and should be as concise as possible. We recommend that authors have their manuscript checked by an English language native speaker before submission, to ensure that submissions are judged at peer review exclusively on academic merit.

We list a number of third-party services specialising in language editing and / or translation, and suggest that authors contact as appropriate. Use of any of these services is voluntary, and at the author's own expense.

Spelling should generally be that of the *Concise Oxford Dictionary* (1995), 9th ed. Oxford: Clarendon Press.

Authors are advised to consult a current issue in order to make themselves familiar with PHN as to typographical and other conventions, layout of tables etc.

Authorship

The Journal conforms to the International Committee of Medical Journal Editors (ICMJE) definition of authorship. Authorship credit should be based on:

1. Substantial contributions to conception and design, data acquisition, analysis and/or interpretation;
2. Drafting the article or revising it critically for important intellectual content; and
3. Final approval of the version to be published.

The contribution of individuals who were involved in the study but do not meet these criteria should be described in the Acknowledgments section.

Ethical standards

All submissions must abide by the guidelines in the World Medical Association (2000) Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects, with notes of clarification of 2002 and 2004 (<http://www.wma.net/en/30publications/10policies/b3/>), the Guidelines on the Practice of Ethics Committees Involved in Medical Research Involving Human Subjects (3rd ed., 1996; London: The Royal College of Physicians) and the Guidelines for the Ethical Conduct of Medical Research Involving Children, revised in 2000 by the Royal College of Paediatrics and Child Health: Ethics Advisory Committee (*Arch Dis Child* (2000) 82, 177–182).

Cover Letter

Authors are invited to submit a cover letter including a short explanation of how the article advances the field of public health nutrition in terms of research, practice, or policy, and of its relevance to an international readership. The text for the cover letter should be entered in the appropriate box as part of the online submission process.

Title Page

Authors must submit a title page online **as a separate file to their manuscript**, to enable double-blind reviewing. For the same reason, the information on the title page should **not** be included in the manuscript itself. The title page should include:

1. The title of the article;
2. Authors' names, given without titles or degrees;
3. Name and address of department(s) and institution(s) to which the work should be attributed for each author, with each author's institution(s) identified by a superscript number (e.g. A.B. Smith¹);
4. Name, mailing address, email address, telephone and fax numbers of the author responsible for correspondence about the manuscript;
5. A shortened version of the title, not exceeding 45 characters (including letters and spaces) in length;
6. Disclosure statements, as outlined below. These must be included on the title page and **not in the manuscript file**, to enable double-blind reviewing; if the paper is accepted, they will be inserted into the manuscript during production.

Acknowledgments

Here you may acknowledge individuals or organizations that provided advice and/or support (non-financial). Formal financial support and funding should be listed in the following section.

Financial Support

Please provide details of the sources of financial support for all authors, including grant numbers. For example, "This work was supported by the Medical research Council (grant number XXXXXXXX)". Multiple grant numbers should be separated by a comma and space, and where research was funded by more than one agency the different agencies should be separated by a semi-colon, with "and" before the final funder. Grants held by different authors should be identified as belonging to individual authors by the authors' initials. For example, "This work was supported by the Wellcome Trust (A.B., grant numbers XXXX, YYYY), (C.D., grant number ZZZZ); the Natural Environment Research Council (E.F., grant number FFFF); and the National Institutes of Health (A.B., grant number GGGG), (E.F., grant number HHHH)".

This disclosure is particularly important in the case of research supported by industry, including not only direct financial support for the study but also support in kind such as provision of medications, equipment, kits or reagents without charge or at reduced cost and provision of services such as statistical analysis. **All such support**, financial and in kind, should be disclosed here.

Where no specific funding has been provided for research, please provide the following statement: “This research received no specific grant from any funding agency, commercial or not-for-profit sectors.”

In addition to the source of financial support, please state whether the funder contributed to the study design, conduct of the study, analysis of samples or data, interpretation of findings or the preparation of the manuscript. If the funder made no such contribution, please provide the following statement: “[Funder’s name] had no role in the design, analysis or writing of this article.”

Conflict of Interest

Conflict of interest exists when an author has interests that might inappropriately influence his or her judgement, even if that judgement is not influenced. Because of this, authors must disclose potentially conflicting interests so that others can make judgements about such effects. Please provide details of all known financial and non-financial (professional and personal) relationships with the potential to bias the work. Where no known conflicts of interest exist, please include the following statement: “None.”

For more information on what constitutes a conflict of interest, please see the ICMJE guidelines.

Authorship

Please provide a very brief description of the contribution of each author to the research. Their roles in formulating the research question(s), designing the study, carrying it out, analysing the data and writing the article should be made plain.

Ethical Standards Disclosure

Manuscripts describing experiments involving human subjects must include the following statement: “This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving human subjects/patients were approved by the [name of the ethics committee]. Written [or Verbal] informed consent was obtained from all

subjects/patients.” Where verbal consent was obtained, this must be followed by a statement such as: “Verbal consent was witnessed and formally recorded.”

Manuscript Format

The requirements of PHN are in accordance with the Uniform Requirements for Manuscripts Submitted to Biomedical Journals produced by the ICMJE, and authors are encouraged to consult the latest guidelines, which contain useful, general information about preparing scientific papers. Authors should also consult the CONSORT guidelines for reporting results of randomised trials.

For detailed instructions regarding **mathematical modelling**, **statistical analysis** and **nomenclature requirements**, please refer to the Appendix to these instructions.

Typescripts should be prepared with 1.5 line spacing and wide margins (2 cm), the preferred font being Times New Roman size 12. At the ends of lines, words should not be hyphenated unless hyphens are to be printed. **Line numbering and page numbering are required.**

Manuscripts should be organised as follows:

Abstract

Each paper must open with a structured abstract of **not more than 250 words**. The abstract should consist of the following headings: Objective, Design, Setting, Subjects, Results, Conclusions. All the headings should be used, and there should be a separate paragraph for each one. The abstract should be intelligible without reference to text or figures.

Keywords

Authors should list at least four keywords or phrases (each containing up to three words).

Introduction

It is not necessary to introduce a paper with a full account of the relevant literature, but the introduction should indicate briefly the nature of the question asked and the reasons for asking it.

Methods

For manuscripts describing experiments involving human subjects, the required ethical standards disclosure statement must be included **on the title page only** as described above. It will then be inserted into this section of the manuscript during production.

Results

These should be given as concisely as possible, using figures or tables as appropriate. Data should not be duplicated in tables and figures.

Discussion

While it is generally desirable that the presentation of the results and the discussion of their significance should be presented separately, there may be occasions when combining these sections may be beneficial. Authors may also find that additional or alternative sections such as ‘conclusions’ may be useful.

References

References should be numbered consecutively in the order in which they first appear in the text using superscript Arabic numerals in parentheses, e.g. ‘The conceptual difficulty of this approach has recently been highlighted(1,2–4)’. If a reference is cited more than once, the same number should be used each time. References cited only in tables and figure legends should be numbered in sequence from the last number used in the text and in the order of mention of the individual tables and figures in the text.

Names and initials of authors of unpublished work should be given in the text as ‘unpublished results’ and not included in the References.

At the end of the paper, on a page(s) separate from the text, references should be listed in numerical order using the Vancouver system. When an article has more than three authors only the names of the first three authors should be given followed by ‘*et al.*’ The issue number should be omitted if there is continuous pagination throughout a volume. Titles of journals should appear in their abbreviated form using the NCBI LinkOut page. References to books and monographs should include the town of publication and the number of the edition to which reference is made. References to material available on websites should include the full Internet address, and the date of the version cited.

Examples of correct forms of references are given below.

Journal articles

1. Setchell KD, Faughnan MS, Avades T *et al.* (2003) Comparing the pharmacokinetics of daidzein and genistein with the use of ¹³C-labeled tracers in premenopausal women. *Am J Clin Nutr* **77**, 411–419.

2. Barker DJ, Winter PD, Osmond C *et al.* (1989) Weight in infancy and death from ischaemic heart disease. *Lancet* **ii**, 577–580.

3. Forchielli ML & Walker WA (2005) The role of gut-associated lymphoid tissues and mucosal defence. *Br J Nutr* **93**, Suppl. 1, S41–S48.

4. Skurk T, Herder C, Kraft I *et al.* (2004) Production and release of macrophage migration inhibitory factor from human adipocytes. *Endocrinology* (Epublication ahead of print version).

Books and monographs

5. Bradbury J (2002) Dietary intervention in edentulous patients. PhD Thesis, University of Newcastle.

6. Ailhaud G & Hauner H (2004) Development of white adipose tissue. In *Handbook of Obesity. Etiology and Pathophysiology*, 2nd ed., pp. 481–514 [GA Bray and C Bouchard, editors]. New York: Marcel Dekker.

7. Bruinsma J (editor) (2003) *World Agriculture towards 2015/2030: An FAO Perspective*. London: Earthscan Publications.

8. World Health Organization (2003) *Diet, Nutrition and the Prevention of Chronic Diseases. Joint WHO/FAO Expert Consultation. WHO Technical Report Series* no. 916. Geneva: WHO.

9. Keiding L (1997) *Astma, Allergi og Anden Overfølsomhed i Danmark – Og Udviklingen 1987–1991 (Asthma, Allergy and Other Hypersensitivities in Denmark, 1987–1991)*. Copenhagen, Denmark: Dansk Institut for Klinisk Epidemiologi.

Sources from the internet

10. Nationmaster (2005) HIV AIDS – Adult prevalence rate. http://www.nationmaster.com/graph-T/hea_hiv_aid_adu_pre_rat (accessed June 2013).

Tables

Tables should be placed in the main manuscript file at the end of the document, not within the main text. Be sure that each table is cited in the text. Tables should carry headings describing their content and should be comprehensible without reference to the text. Tables should not be subdivided by ruled lines.

The dimensions of the values, e.g. mg/kg, should be given at the top of each column. Separate columns should be used for measures of variance (SD, SE etc.), the \pm sign should not be used.

The number of decimal places used should be standardized; for whole numbers 1.0, 2.0 etc. should be used. Shortened forms of the words weight (wt) and height (ht) may be used to save space in tables.

Footnotes are given in the following order: (1) abbreviations, (2) superscript letters, (3) symbols. Abbreviations are given in the format: RS, resistant starch. Abbreviations in tables must be defined in footnotes in the order that they appear in the table (reading from left to right across the table, then down each column). Symbols for footnotes should be used in the sequence: * † ‡ § || ¶, then ** etc. (omit * or †, or both, from the sequence if they are used to indicate levels of significance).

For indicating statistical significance, superscript letters or symbols may be used. Superscript letters are useful where comparisons are within a row or column and the level of significance is uniform, e.g. ‘a,b,c Mean values within a column with unlike superscript letters were significantly different ($P < 0.05$)’. Symbols are useful for indicating significant differences between rows or columns, especially where different levels of significance are found, e.g. ‘Mean values were significantly different from those of the control group: * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$ ’. The symbols used for P values in the tables must be consistent.

Figures

Figures should be supplied as separate electronic files. Figure legends should be grouped in a section at the end of the manuscript text. Each figure should be clearly marked with its number and separate panels within figures should be clearly marked (a), (b), (c) etc. so that they are easily identifiable when the article and figure files are merged for review. Each figure, with its legend, should be comprehensible without reference to the text and should include definitions of abbreviations.

We recommend that only TIFF, EPS or PDF formats are used for electronic artwork. Other formats (e.g., JPG, PPT and GIF files and images created in Microsoft Word) are usable but generally NOT suitable for conversion to print reproduction. For further information about how to prepare your figures, including sizing and resolution requirements, please see our artwork guide.

In curves presenting experimental results the determined points should be clearly shown, the symbols used being, in order of preference, ○, ●, Δ, ▲, □, ■, ×, +. Curves and symbols should not extend beyond the experimental points. Scale-marks on the axes should be on the inner side

of each axis and should extend beyond the last experimental point. Ensure that lines and symbols used in graphs and shading used in histograms are large enough to be easily identified when the figure size is reduced to fit the printed page.

Colour figures will be published online free of charge, and there is a fee of £300 per figure for colour figures in the printed version. If you request colour figures in the printed version, you will be contacted by CCC-Rightslink who are acting on our behalf to collect colour charges. Please follow their instructions in order to avoid any delay in the publication of your article.

Supplementary material

Additional data (e.g. data sets, large tables) relevant to the paper can be submitted for publication online only, where they are made available via a link from the paper. The paper should stand alone without these data. Supplementary Material must be cited in a relevant place in the text of the paper.

Although Supplementary Material is peer reviewed, it is not checked, copyedited or typeset after acceptance and it is loaded onto the journal's website exactly as supplied. You should check your Supplementary Material carefully to ensure that it adheres to journal styles. Corrections cannot be made to the Supplementary Material after acceptance of the manuscript. Please bear this in mind when deciding what content to include as Supplementary Material.

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PDF proofs are sent to authors in order to make sure that the paper has been correctly set up in type. Only changes to errors induced by typesetting/copy-editing or typographical errors will be accepted. Corrected proofs should be returned within 2 days by email to Gill Watling at gillwatling@btinternet.com. If corrected proofs are not received from authors within 7 days the paper may be published as it stands.

Offprints

A PDF file of the paper will be supplied free of charge to the corresponding author of each paper, and offprints may be ordered on the order form sent with the proofs.

CONTACT

Prospective authors may contact the Editorial Office directly on +44 (0) 1223 327954 (telephone) or phn.edoffice@cambridge.org (email).

Additionally, more information about the journal, including recent issues, can be found at <http://journals.cambridge.org/phn>.

APPENDIX: MATHEMATICAL MODELLING, STATISTICS AND NOMENCLATURE

Mathematical modelling of nutritional processes

Papers in which mathematical modelling of nutritional processes forms the principal element will be considered for publication provided: (a) they are based on sound biological and mathematical principles; (b) they advance nutritional concepts or identify new avenues likely to lead to such advances; (c) assumptions used in their construction are fully described and supported by appropriate argument; (d) they are described in such a way that the nutritional purpose is clearly apparent; (e) the contribution of the model to the design of future experimentation is clearly defined.

Units

Results should be presented in metric units according to the International System of Units (see *Quantities, Units and Symbols in Physical Chemistry*, 3rd ed. (2007) Cambridge: RSC Publishing), and *Metric Units, Conversion Factors and Nomenclature in Nutritional and Food Sciences* (1972) London: The Royal Society – as reproduced in *Proceedings of the Nutrition Society* (1972) **31**, 239–247). SI units should be used throughout the paper. The author will be asked to convert any values that are given in any other form. The only exception is where there is a unique way of expressing a particular variable that is in widespread use. Energy values must be given in Joules (MJ or kJ) using the conversion factor 1 kcal = 4.184 kJ. If required by the author, the value in kcal can be given afterwards in parentheses. Temperature is given in degrees Celsius (°C). Vitamins should be given as mg or µg, not as IU.

For substances of known molecular mass (Da) or relative molecular mass, e.g. glucose, urea, Ca, Na, Fe, K, P, values should be expressed as mol/l; for substances of indeterminate molecular mass (Da) or relative molecular mass, e.g. phospholipids, proteins, and for trace elements, e.g. Cu, Zn, then g/l should be used.

The 24 h clock should be used, e.g. 15.00 hours.

Units are: year, month, week, d, h, min, s, kg, g, mg, µg, litre, ml, µl, fl. To avoid misunderstandings, the word litre should be used in full, except in terms like g/l. Radioactivity should be given in becquerels (Bq or GBq) not in Ci. 1 MBq = 27.03 µCi (1Bq = 1 disintegration/s).

Statistical treatment of results

Data from individual replicates should not be given for large experiments, but may be given for small studies. The methods of statistical analysis used should be described, and references to statistical analysis packages included in the text, thus: Statistical Analysis Systems statistical software package version 6.11 (SAS Institute, Cary, NC, USA). Information such as analysis of variance tables should be given in the paper only if they are relevant to the discussion. A statement of the number of replicates, their average value and some appropriate measure of variability is usually sufficient.

Comparisons between means can be made by using either confidence intervals (CI) or significance tests. The most appropriate of such measures is usually the standard error of a difference between means (SED), or the standard errors of the means (SE or SEM) when these vary between means. The standard deviation (SD) is more useful only when there is specific interest in the variability of individual values. The degrees of freedom (df) associated with SED, SEM or SD should also be stated. The number of decimal places quoted should be sufficient but not excessive. Note that pH is an exponential number, as are the log(10) values often quoted for microbial numbers. Statistics should be carried out on the scalar rather than the exponential values.

If comparisons between means are made using CI, the format for presentation is, e.g. 'difference between means 0.73 (95 % CI 0.314, 1.36) g'. If significance tests are used, a statement that the difference between the means for two groups of values is (or is not) statistically significant should include the level of significance attained, preferably as an explicit P value (e.g. P=0.016 or P=0.32) rather than as a range (e.g. P<0.05 or P>0.05}. It should be stated whether the

significance levels quoted are one-sided or two-sided. Where a multiple comparison procedure is used, a description or explicit reference should be given. Where appropriate, a superscript notation may be used in tables to denote levels of significance; similar superscripts should denote lack of a significant difference.

Where the method of analysis is unusual, or if the experimental design is at all complex, further details (e.g. experimental plan, raw data, confirmation of assumptions, analysis of variance tables, etc.) should be included.

Chemical formulas

These should be written as far as possible on a single horizontal line. With inorganic substances, formulas may be used from first mention. With salts, it must be stated whether or not the anhydrous material is used, e.g. anhydrous CuSO_4 , or which of the different crystalline forms is meant, e.g. $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, $\text{CuSO}_4 \cdot \text{H}_2\text{O}$.

Descriptions of solutions, compositions and concentrations

Solutions of common acids, bases and salts should be defined in terms of molarity (M), e.g. 0.1 M- NaH_2PO_4 . Compositions expressed as mass per unit mass (w/w) should have values expressed as ng, μg , mg or g per kg; similarly for concentrations expressed as mass per unit volume (w/v), the denominator being the litre. If concentrations or compositions are expressed as a percentage, the basis for the composition should be specified (e.g. % (w/w) or % (w/v) etc.). The common measurements used in nutritional studies, e.g. digestibility, biological value and net protein utilization, should be expressed as decimals rather than as percentages, so that amounts of available nutrients can be obtained from analytical results by direct multiplication. See *Metric Units, Conversion Factors and Nomenclature in Nutritional and Food Sciences*. London: The Royal Society, 1972 (para. 8).

Gene nomenclature and symbols

The use of symbols and nomenclature recommended by the HUGO Gene Nomenclature Committee is encouraged. Information on human genes is also available from Entrez Gene, on mouse genes from the Mouse Genome Database and on rat genes from the Rat Genome Database.

Nomenclature of vitamins

Most of the names for vitamins and related compounds that are accepted by the Editors are those recommended by the IUNS Committee on Nomenclature. See <i>Nutrition Abstracts and Reviews</i> (1978) 48A , 831–835. Acceptable name	<i>Other names*</i>
<i>Vitamin A</i>	
Retinol	Vitamin A1
Retinaldehyde, retinal	Retinene
Retinoic acid (all-trans or 13-cis)	Vitamin A1 acid
3-Dehydroretinol	Vitamin A2
<i>Vitamin D</i>	
Ergocalciferol, ercalciol	Vitamin D2 calciferol
Cholecalciferol, calciol	Vitamin D3
<i>Vitamin E</i>	
α -, β - and γ -tocopherols plus tocotrienols	
<i>Vitamin K</i>	
Phylloquinone	Vitamin K1
Menaquinone-n (MK-n) [†]	Vitamin K2
Menadione	Vitamin K3, menaquinone, menaphthone
<i>Vitamin B1</i>	
Thiamin	Aneurin(e), thiamine
<i>Vitamin B2</i>	
Riboflavin	Vitamin G, riboflavine, lactoflavin
<i>Niacin</i>	

Nicotinamide	Vitamin PP
Nicotinic acid	
<i>Folic Acid</i>	
Pteroyl(mono)glutamic acid	Folacin, vitamin Bc or M
<i>Vitamin B6</i>	
Pyridoxine	Pyridoxol
Pyridoxal	
Pyridoxamine	
<i>Vitamin B12</i>	
Cyanocobalamin	

2 Addendum B

Ethics approval documents: REC



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Approved with Stipulations New Application

25-Apr-2014
Müller, Anna-Marie A

Proposal #: DESC-Muller/2014
Title: Eradicating stunting in sub-Saharan Africa: a review of intervention.

Dear Ms. Anna-Marie Müller,

Your **New Application** received on **06-Mar-2014**, was reviewed
Please note the following information about your approved research proposal:

Proposal Approval Period: **27-Mar-2014 -26-Mar-2015**

The following stipulations are relevant to the approval of your project and must be adhered to:

1) Permission from relevant authorities/institutions

The researcher is reminded that she has to seek permission from the relevant authorities when accessing information that is not available in the public domain. It is also required that the researcher obtain written permission from public spaces/ institutions where observation will take place.

2) Inclusion of SU staff or students in the study

In the event that staff, students or alumni of the university will be approached to participate in the study, institutional permission should be sought from the Division for Institutional Research and Planning.

3) Informed consent form

The researcher is requested to prepare and submit to the DESC a copy of the informed consent form to be presented to individuals and institutions during interviews.

Please provide a letter of response to all the points raised IN ADDITION to HIGHLIGHTING or using the TRACK CHANGES function to indicate ALL the corrections/amendments of ALL DOCUMENTS clearly in order to allow rapid scrutiny and appraisal.

Please take note of the general Investigator Responsibilities attached to this letter. You may commence with your research after complying fully with these guidelines.

Please remember to use your **proposal number (DESC-Muller/2014)** on any documents or correspondence with the REC concerning your research proposal.

Please note that the REC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

Also note that a progress report should be submitted to the Committee before the approval period has expired if a continuation is required. The Committee will then consider the continuation of the project for a further year (if necessary).

This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki and the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health). Annually a number of projects may be selected randomly for an external audit.

National Health Research Ethics Committee (NHREC) registration number REC-050411-032.

We wish you the best as you conduct your research.

If you have any questions or need further help, please contact the REC office at 0218089183.

Included Documents:

DESC application
Research proposal_Muller

Sincerely,

Clarissa GRAHAM
REC Coordinator
Research Ethics Committee: Human Research (Humanities)

Investigator Responsibilities

Protection of Human Research Participants

Some of the general responsibilities investigators have when conducting research involving human participants are listed below:

1. **Conducting the Research.** You are responsible for making sure that the research is conducted according to the REC approved research protocol. You are also responsible for the actions of all your co-investigators and research staff involved with this research. You must also ensure that the research is conducted within the standards of your field of research.
2. **Participant Enrollment.** You may not recruit or enroll participants prior to the REC approval date or after the expiration date of REC approval. All recruitment materials for any form of media must be approved by the REC prior to their use. If you need to recruit more participants than was noted in your REC approval letter, you must submit an amendment requesting an increase in the number of participants.
3. **Informed Consent.** You are responsible for obtaining and documenting effective informed consent using **only** the REC-approved consent documents, and for ensuring that no human participants are involved in research prior to obtaining their informed consent. Please give all participants copies of the signed informed consent documents. **Keep the originals in your secured research files for at least five (5) years.**
4. **Continuing Review.** The REC must review and approve all REC-approved research proposals at intervals appropriate to the degree of risk but not less than once per year. There is **no grace period**. Prior to the date on which the REC approval of the research expires, **it is your responsibility to submit the continuing review report in a timely fashion to ensure a lapse in REC approval does not occur.** If REC approval of your research lapses, you must stop new participant enrollment, and contact the REC office immediately.
5. **Amendments and Changes.** If you wish to amend or change any aspect of your research (such as research design, interventions or procedures, number of participants, participant population, informed consent document, instruments, surveys or recruiting material), you must submit the amendment to the REC for review using the current Amendment Form. You **may not initiate** any amendments or changes to your research without first obtaining written REC review and approval. The **only exception** is when it is necessary to eliminate apparent immediate hazards to participants and the REC should be immediately informed of this necessity.
6. **Adverse or Unanticipated Events.** Any serious adverse events, participant complaints, and all unanticipated problems that involve risks to participants or others, as well as any research related injuries, occurring at this institution or at other performance sites must be reported to Malene Fouch within **five (5) days** of discovery of the incident. You must also report any instances of serious or continuing problems, or non-compliance with the RECs requirements for protecting human research participants. The only exception to this policy is that the death of a research participant must be reported in accordance with the Stellenbosch University Research Ethics Committee Standard Operating Procedures. All reportable events should be submitted to the REC using the Serious Adverse Event Report Form.
7. **Research Record Keeping.** You must keep the following research related records, at a minimum, in a secure location for a minimum of five years: the REC approved research proposal and all amendments; all informed consent documents; recruiting materials; continuing review reports; adverse or unanticipated events; and all correspondence from the REC
8. **Provision of Counselling or emergency support.** When a dedicated counsellor or psychologist provides support to a participant without prior REC review and approval, to the extent permitted by law, such activities will not be recognised as research nor the data used in support of research. Such cases should be indicated in the progress report or final report.
9. **Final reports.** When you have completed (no further participant enrollment, interactions, interventions or data analysis) or stopped work on your research, you must submit a Final Report to the REC.
10. **On-Site Evaluations, Inspections, or Audits.** If you are notified that your research will be reviewed or audited by the sponsor or any other external agency or any internal group, you must inform the REC immediately of the impending audit/evaluation.



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Approval Notice
Stipulated documents/requirements

02-Jul-2014
Müller, Anna-Marie A

Proposal #: DESC-Muller/2014
Title: Eradicating stunting in sub-Saharan Africa: a review of intervention.

Dear Ms. Anna-Marie Müller,

Your **Stipulated documents/requirements** received on **02-Jul-2014**, was reviewed
Sincerely,

Clarissa GRAHAM
REC Coordinator
Research Ethics Committee: Human Research (Humanities)

3 Addendum C

Interview discussion guide

An overview of childhood stunting and associated nutrition policy strategies in sub-Saharan Africa

Researcher: Anna-Marie Müller, MPhil Candidate, Sustainability Institute

Interview discussion guide

Overarching theme of interview is to determine the establishment, maintenance and sustainability of the enabling environment for nutrition (with specific reference to child nutrition and stunting) in the KZN Department of Health, with specific focus on the Directorate: Nutrition.

Introduction

1. Please describe your background and career path.
2. What motivates and fuels your passion for nutrition?
3. How would you describe your leadership style?
4. What lead you to adopt your specific approach to nutrition leadership?

Questions according to theme

Priority-setting, policy and politics

1. What is the process whereby nutrition priorities are set in the province, and are any tools used for this process (eg LiST, CHNRI)?
2. How do you identify nutrition needs for the province?
3. What are your goals and objectives for nutrition in the province?
4. What are your goals and objectives for child nutrition (and specifically stunting) in the province?
5. How are priorities translated into policy?
6. What is the political economy of nutrition in KZN?
7. What is the political economy of child nutrition in KZN?
8. What are the most robust drivers of change for nutrition?
9. What are, in your opinion, the most robust interventions?

Coordination

1. Does a provincial coordinating body exist to address nutrition issues?
2. If so, is this inter-ministerial? Does it engage with non-state actors (private-public, academic institutions, civil society, etc)?
3. How do you facilitate coordination amongst sectors? What is the mechanism used to enable coordination?
4. To what extent is the agriculture-nutrition interface utilised in the province?
5. How can the different stakeholders reconcile their mandates to start working together on nutrition issues?

Capacity and leadership

1. How do you inspire commitment and action for nutrition in your Directorate at provincial level?
2. How do you inspire commitment and action for nutrition in your workforce at implementation level?
3. What is your strategy to sustain momentum in planning and executing service delivery for nutrition?
4. Describe the nutrition workforce in the province.
5. What is the percentage dietitians/nutritionists/nurses/community-level healthcare workers dedicated to nutrition service delivery?
6. How is knowledge and evidence from research updated in the nutrition workforce (refresher courses, who provides training)?
7. How is further training and development in nutrition encouraged in the DoH, the Directorate?

Monitoring and evaluation

1. What systems are in place for monitoring and evaluation of child nutrition – with specific reference to stunting?
2. Are these systems audited externally and independently?

Management

1. Describe the process of the nutrition budget allocation.
2. Are you satisfied with this process? How would you describe an ideal approach to nutrition budget allocation?

3. How are external sources of funding approached, managed and reported on?

4 Addendum D

Request for participation in MPhil Research

Stellenbosch

23 June 2014

Ms Lenore Spies

Director: Nutrition

Department of Health

KwaZulu-Natal Provincial Government

Dear Ms Spies

Herewith a request to you for participation in my MPhil research project titled “An overview of childhood stunting and associated nutrition policy strategies in sub-Saharan Africa”. The research has been approved by the Research Ethics Committee: Humanoria at Stellenbosch University and will be conducted according to accepted and applicable national and international ethical guidelines and principles. I would like to conduct an interview with you in which I will aim to gain insight into your strategy and approach to stunting and malnutrition reduction in the province of KwaZulu-Natal. The reason behind this selection is that the province has shown good progress in reducing stunting levels in young children and the leadership of the Nutrition Programme in the province has been commended at various forums. I believe that the interview could shed valuable light on a successful nutrition policy interpretation and implementation approach with the necessary accompanying leadership to achieve scaling-up of evidence-based nutrition interventions.

The intended interview fits into the broad objectives of my project, namely to engage with the literature on stunting and nutrition interventions. This is complemented with a qualitative component, in order to gain insights into the systems that aim to reduce stunting in our country and the rest of the sub-Saharan Africa region. These objectives were defined from the problem statement that, although reviews of nutrition policy and programmes are positive about the content and intent of such documents, the prevalence of the nutritional disorder stunting is remaining at concerning levels in South Africa and the rest of Sub-Saharan Africa. Successful

intervention strategies must be implemented to achieve lower rates of incidence that can ensure better likelihood of achieving sustainable communities.

I hope that you will respond positively to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'A Müller', written in a cursive style.

Anna-Marie Müller

MPhil Sustainable Development Candidate

Sustainability Institute, School of Public Leadership

Stellenbosch University

5 Addendum E



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PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

TITLE OF THE RESEARCH PROJECT:

An overview of childhood stunting and associated nutrition policy strategies in sub-Saharan Africa^P

PRINCIPAL INVESTIGATOR:

Anna-Marie Müller

ADDRESS:

Stellenbosch University

PO Box X1

Matieland

7602

CONTACT NUMBER:

0729062906

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the researcher any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free

^P Since the interview was completed in September 2014, the research title has changed. This document is consistent with the title at the time to maintain integrity.

to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the Research Ethics Committee: Humanoria at Stellenbosch University and will be conducted according to the ethical guidelines and principles of the University's Faculty of Economic and Management Sciences Protocol for Ethical Research.

a. What is this research study all about?

- The research aims to bring more understanding in the system of implementation of nutrition policy in South Africa.
- Due to the persistent high prevalence of the nutrition disorder “stunting”, there is concern for the capacity to overcome this burden. This study has two components. The first is a desktop investigation of nutrition policies in sub-Saharan Africa. The second is a qualitative engagement with key individuals who work with implementation of nutrition policy in South Africa. The qualitative component will be achieved through interviews.
- The interviews will be conducted in English, if necessary, a translator can be used.

b. Why have you been invited to participate?

- The researcher wishes to ask questions about the level of implementation of nutrition policy in South Africa. For this purpose, you have been identified as a link in the system that creates and implements policy and programmes relevant to the nutrition disorder “stunting”. The hope is that your experiences will provide valuable insights into this system.

c. What will your responsibilities be?

- The primary responsibility of the interviewee is to respond truthfully and candidly to questions posed.
- The questions posed during the interview will ask about the strategies, challenges and successes of working with nutrition in the Department of Health in your particular context. The interview will be semi-structured to allow a natural development of the conversation.

- The interview will be recorded and transcribed, and before publication, you will have the opportunity to read and comment on the write-up about the interview. Without your consent of the final document, neither the interview nor the interpretation thereof will be published.
 - The interview is expected to last no more than two hours, and the request is that you will make yourself available for that duration on the day and time of the interview in order to conduct the interview without interruption.
- d. Will you benefit from taking part in this research?**
- The benefits of this research are not to you personally, but the hope is that in future, South Africa will have a lower prevalence and incidence of stunting. By understanding the implementation of policy and programmes better, the hope is to achieve this goal.
- e. Are there in risks involved in your taking part in this research?**
- No risks have been identified at present. As the interview is designed to ask questions about your professional activities, it is highly unlikely that any emotional distress will be caused.
- f. What will happen in the unlikely event of some form injury occurring as a direct result of your taking part in this research study?**
- No injury is expected as the research is non-clinical qualitative in nature.
- g. Will you be paid to take part in this study and are there any costs involved?**
- No you will not be paid to take part in the study. There will be no costs involved for you, if you do take part.
- h. Is there any thing else that you should know or do?**
- If you have any concerns or complaints that have not been adequately addressed by the researcher, you can contact Mrs Malène Fouche [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.
 - You will receive a copy of this information and consent form for your own records.
- i. Declaration by participant**

By signing below, I agree to take part in a research study entitled ‘An overview of childhood stunting and associated nutrition policy strategies in sub-Saharan Africa’.

I declare that:

I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.

I have had a chance to ask questions and all my questions have been adequately answered.

I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.

I may choose to leave the study at any time and will not be penalised or prejudiced in any way.

I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (*place*) on (*date*) 2014.

Signature of participant

Signature of witness

j. Declaration by investigator

I (*name*) declare that:

I explained the information in this document to

I encouraged him/her to ask questions and took adequate time to answer them.

I am satisfied that he/she adequately understands all aspects of the research, as discussed above

I did/did not use a interpreter. (*If an interpreter is used then the interpreter must sign the declaration below.*)

Signed at (*place*) on (*date*) 2014.

Signature of investigator

Signature of witness

k. Declaration by interpreter

I (*name*) declare that:

I assisted the investigator (*name*) to explain the information in this document to (*name of participant*) using the language medium of Afrikaans/Xhosa.

We encouraged him/her to ask questions and took adequate time to answer them.

I conveyed a factually correct version of what was related to me.

I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her question satisfactorily answered.

Signed at (*place*) on (*date*)

Signature of interpreter

Signature of witness