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**Fighting Malnutrition and Non-Communicable Diseases:**

An Examination and Analysis of the Roles of Clinical Nutrition Professionals in Lusaka,  
Zambia

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## **Abstract**

The rates of malnutrition in Zambia are high and stagnant while the rates of non-communicable diseases (NCDs) are rising. This emerging double burden of disease calls for a targeted response. Since malnutrition has been proven to be related to the development of NCDs, and nutrition interventions are known to be an effective way to combat malnutrition, it is crucial that nutrition interventions are highlighted as valuable methods for fighting this double burden of disease. The purpose of this research study is to emphasize the role of skilled nutritionists and dietitians in improving patient outcomes and to advocate for the clinical nutrition profession in Zambia. Through a literature review and a series of expert stakeholder interviews, we compiled the perceptions, challenges, and experiences of a variety of nutritionists. Thus, this paper aims to provide a unique platform for nutritionists to hear each other's perceptions, to give voice to their desired changes, and to call the attention of the government, the public, and the health sector. Inspired by current Zambian nutritionists and based on our findings, we made a series of conclusions and recommendations: there needs to be a shift in attitudes regarding nutrition, a scaled-up approach to nutrition education, a standardized form of nutrition practice, and a stronger presence of the Nutrition Association of Zambia (NAZ). These changes should help to enhance and reinforce the vital role that nutritionists play in the fight against malnutrition, NCDs and more.

## **Acronyms**

|        |   |
|--------|---|
| BSc    | Bachelor of Science   |
| CHW    | Community health worker   |
| HPCZ   | Health Professions Council of Zambia                                    |
| HPHE   | High protein, high energy diet  |
| LMMU   | Levy Mwanawasa Medical University                                       |
| MoH    | Ministry of Health  |
| NAZ    | Nutrition Association of Zambia   |
| NCD(s) | Non-communicable disease(s)   |
| NRDC   | National Resource Development College                                   |
| SAIPAR | Southern African Institute for Policy and Research                      |
| SGA    | Subjective Global Assessment  |
| SOAPIE | Subjective, objective, assessment, plan, implementation, and evaluation |
| SUN    | Scale Up Nutrition  |
| UNZA   | University of Zambia  |

# Introduction

## Background

Like many other sub-Saharan African countries, Zambia has been facing high rates of malnutrition since the early 1990s (Richards, K., & Bellack, S., 2016). To combat this problem, the country has partnered with different international donors and organizations to create health-related interventions. However, despite the numerous efforts put forth by the government and international donors, there has not been a significant change in the nutrition status of the country; as of 2014, Zambia had the highest rate of undernutrition when compared to other sub-Saharan African nations (FAO, IFAD & WFP, 2014). These high rates of malnutrition and stagnant nutrition status can be attributed to many different factors including the burden of national debt, a lack of government prioritization of the nutrition field, the collapse of world copper prices, and a lack of nutrition policies ("The National Food and Nutrition Policy", 2011).

In the case of the national debt, for example, the government has put forth most of its budget to the payment of this debt: 36.1% of the 2018 national budget was used for general public services, which includes external and domestic debt payment. Of this 36.1%, a total of 19.85% was directly allocated to debt payment. Therefore, as a result of the government prioritizing debt payment, it has stripped funding away from health oriented activities; only 9.5% of the 2018 budget was allocated to health. In conclusion, the prioritization of debt payment has resulted in the government forsaking other sectors and not prioritizing health and nutrition.

Additionally, the stagnant nutrition status of the country calls into question the effectiveness of the interventions and projects implemented by both the government and international donors. By examining the stunting, wasting and underweight rates of children under 5 years old, it is clear that the nutrition status of the country has not significantly improved over the years.<sup>1</sup>

In addition to the unimproving rates of malnutrition, Zambia has also seen increasing rates of NCDs, which has resulted in the country facing a double burden of disease within recent years. The most common NCDs include cardiovascular diseases, type II diabetes, cancers, chronic respiratory diseases, epilepsy, mental illnesses, oral health, eye diseases, injuries and sickle cell anemia (African Health Observatory, 2019). According to WHO,

<sup>1</sup> See Appendix Table 1 for stunting, wasting, and underweight rates

cardiovascular diseases, certain cancers, and diabetes are all considered diet-related NCDs because unhealthy diets and poor nutrition are among the top risk factors for these diseases.<sup>2</sup>

With the rising rates of NCDs and stagnant rates of malnutrition, we were left to wonder whether current and past nutrition interventions are effective in Zambia. However, based on our research, we came to realize that perhaps the question is not whether nutrition interventions are effective in Zambia, but rather whether Zambia is conducive for nutrition interventions to be effective and produce observable results. The answer to this question lies in the state of the nutrition profession in Zambia.

For the longest time, Zambia had only been offering diplomas in nutrition and food science. In fact, BSc programs have only started graduating students in recent years. As a result of this, the nutrition professional field currently consists of mainly diploma holders, rather than bachelor's degree holders. The diploma degree is significantly shorter in length than the bachelor's degree program: three years vs five years respectively. However, regardless of the extent of training received by nutrition professionals, they are all expected to practice at the same level (even though diploma degrees only teach technical skills, incorporate fewer background science courses, and contain many agriculturally focused subjects).

As of the 31<sup>st</sup> of May 2019, HPCZ published a list of approved programs that indicated: one institution (NRDC) that offers the diploma in food and nutrition, three institutions that offer a Bachelor of Science in Food and Nutrition (UNZA - School of Agriculture, DMI St. Eugene University, LIUTE BM University) and two institutions that offer a master's degree in nutrition: one in human nutrition (UNZA - School of Agriculture) and the other in public health-nutrition (UNZA - School of Agriculture). However, despite the introduction of both master's and bachelor's degree programs, there is still a lot to be done with regard to the development of the nutrition profession since there are only five programs (from four different institutions) within the whole country that adequately prepare students to practice nutrition within Zambia. Furthermore, stakeholders in this field still question whether students are adequately prepared to do clinical work, due to the fact that these programs don't include a lot of clinical nutrition theory and most importantly don't have supervised clinical nutrition practicals. In conclusion, the nutrition profession can be subjectively categorized as an 'emerging profession' due to the limited number of training institutions and the questionable level of practical skills that students obtain from these training programs. Therefore, in order to increase the effectiveness of nutrition

<sup>2</sup> See Appendix Figure 1 for a graph linking NCDs to behavioral choices and diet

interventions and improve the nutrition status of the country, the nutrition profession needs to be developed. The development of the nutrition profession ensures that all nutrition professionals within the clinical setting are both educationally qualified and have the practical skills to carry out their practice in their respective work environments. Additionally, it allows clinical nutrition professionals to be fully equipped to combat the emerging double disease burden of malnutrition and NCDs.

### **Statement of the Problem**

There has not been significant improvement of the nutrition status of Zambia to date. This is not just due to the lack of effectiveness of the nutrition interventions implemented, but also due to the lack of adequately skilled clinical nutrition professionals within the country. This gap has stemmed from the limited training institutions and the lack of practical training integrated within these nutrition programs: at both the diploma and bachelor's level.

### **Purpose of the Research**

The purpose of the research is to advocate for the nutrition profession by highlighting its importance in the fight against malnutrition and non-communicable diseases. Specifically, this research aims to highlight how the development of the nutrition profession is linked to improved patient outcomes within the clinical setting.

### **Significance of the Research**

This research is important because it will provide a platform for nutrition professionals to hear each other's experiences and challenges within their work setting. Additionally, it will provide an insight to both the public and the government to nutrition professionals' practice and show what role they play in the clinical setting. Furthermore, it will provide a platform on to which nutrition professionals can speak directly to the public, the government and other health professionals and voice their frustrations, challenges and desired changes within their profession. By simply advocating for the profession, we, as researchers, hope to call more government attention to the nutrition professional field and encourage its development.

### **Objectives**

The purpose of this study is to advocate for the nutrition profession in Zambia by

highlighting the importance of nutritionists in the fight against malnutrition and NCDs. In order to achieve this goal, we divided our research into the five specific objectives listed below:

1. How do nutrition professionals' practices differ depending on the hospital/clinic where they work and where they got their training?
2. What are current and past nutrition interventions implemented by the government and nutrition professionals, respectively?
3. Are nutrition interventions in Zambia feasible and effective?
4. What changes would nutrition professionals want to see in their profession and its involvement in the health sector?
5. How are nutrition professionals viewed by the health field, the government, and the public within Zambia? How does this impede or positively affect the extent of their contribution?

These objectives focused our research on collecting information that demonstrates the breadth and differences within the nutrition profession, gives nutritionists a place to voice their opinions and concerns about the field, analyzes the impact of the Zambian context on the practice of nutritionists, and highlights their importance in improving individual and population health. Throughout this paper, the results from interviews and relevant literature will be grouped by these research objectives.

## **Methodology**

Research for this paper was collected through a literature review, interviews with expert stakeholders, and observations of nutritionists. The literature review began at Cornell University in Ithaca, New York, United States of America in late April and early May of 2019, and was continued in Lusaka, Zambia in June of 2019. Documents in this review included Zambia demographic and health data, national Zambian government plans concerning health improvement, the constitutions of the Nutrition Association of Zambia (NAZ) and the Health Professions Council of Zambia (HPCZ), previous research studies on malnutrition and non-communicable diseases, and international guidelines on nutrition practices.

Eleven semi-structured interviews were conducted with expert stakeholders in Lusaka, Zambia in late June and July of 2019. Permission for these interviews was obtained with consent forms, and notes were taken during each interview. Stakeholders were found via



snowball sampling where initial interviewees put us in contact with other stakeholders. As a result, the sample of stakeholders in this study covers a range of different people but is non-random.

In total, eight nutritionists from a variety of workplaces and training backgrounds were interviewed and four of them were shadowed during their work day. Of these nutritionists, one works in a private hospital, four currently work or have worked in a public hospital, two work for a community clinic, and one worked in nutrition and food science research; three were internationally trained, while the rest received all of their education in Zambia. There were executive board representatives, members, and non-members of NAZ included. Additionally, one obstetrician/gynecologist and one diabetic physician from Victoria Hospital (a small private hospital) and one representative of the Ministry of Health were interviewed.<sup>3</sup>

## **Analysis**

To analyze the information, we obtained from interviews and observations, we made a code-book by extracting common themes from transcripts and observation notes.<sup>4</sup> Consequently, our findings and interview notes were categorized under these themes to allow for easier comparison between one interviewee and another. These themes helped to further categorize our findings according to our different research objectives, listed below.

# **Main Findings**

## **Literature Review**

To situate our research in the context of current nutrition interventions in Zambia, we looked at publications, policies, and programs created by the government regarding nutrition. Recently, the Ministry of Health (MoH) released the Zambia National Health Strategic Plan for 2017-2021. In this plan, the MoH acknowledges the importance of nutrition, stating “clinical nutrition and dietetics is essential in tackling current and emerging health conditions” and “a key shift in strategy will be to ensure that nutrition interventions are embedded in the overall plan that addresses diet-related NCDs”. However, currently there are no running programs (though new programs such as the

<sup>3</sup> See Appendix Table 2 for a full list of stakeholders interviewed

<sup>4</sup> See Appendix Table 3 for the code-book used to analyze interviews

LMMU Nutrition and Dietetic Degree are being developed) or policies that focus on developing the clinical nutrition profession have come out of this commitment to nutrition so far. The programs that have been implemented in the nutrition sector in Zambia tend to be more focused on public health nutrition. Government-sponsored nutrition intervention strategies formally began in 1967 with the development of the National Food and Nutrition Commission (NFNC) by an Act of Parliament, Chapter 308, No. 41. The NFNC is an advisory body whose “broad objective is to promote and oversee nutrition activities in the country, primarily focusing on vulnerable groups such as children, and women” (“Nutrition Programmes”, 2015). This organization has created a number of programs, some of which include the First 1,000 Most Critical Days Programme that focuses on reducing levels of malnutrition and stunting in children under two and the Maternal, Adolescent, Infant and Young Child Nutrition Programme (MAIYCN) that focuses on infant and young child feeding and nutrition for adolescents and mothers in order to promote healthy growth.<sup>5</sup> Additionally, the MoH in cooperation with the NFNC has created programs to address micronutrient deficiencies. In a plan developed in 1999, programs for vitamin A supplementation, vitamin A fortification of sugar, and iron-folic acid supplementation for pregnant women were introduced (MOST, USAID Micronutrient Program, 2004).

The government has invested a lot of money into programs related to nutrition, specifically programs that aim to combat the staggering rates of malnutrition, including NFNC projects, the SUN (Scale Up Nutrition) project, diversification of crops, and fortification of maize. With regards to NCDs, there has been a limited number of interventions and proposals. The WHO Global Action Plan for NCDs for 2013-2030 is one of the few NCD focused interventions that is currently being implemented in Zambia. However, the effectiveness of this plan has been questioned due to its use of generic targets and indicators (M. Mukanu, 2017). As stated in a policy analysis on malnutrition and NCDs in Zambia, “there is a need for the domestication of international guidelines and frameworks to match the disease burden, resources and capacities in the local context if policy measures are to be comprehensive, relevant and measurable” (M. Mukanu, 2017). The lack of revision of plans and interventions to fit the intended context leads to them not being effective within that specific context. Plans and interventions are not simply transferable, they have to account for human resources, disease burden, culture and other external factors regarding the context. Hence, this might be one of the reasons why we currently observe stagnant rates. The difference between the country’s nutrition status before and after these interventions were implemented is insignificant and barely visible within the field.

<sup>5</sup> See Appendix Table 4 for a full list of NFNC programs as of 2015

The number of nutrition-focused programs and policies shows that the Zambian government values improvements in nutrition. However, these government programs have not integrated clinical nutritionists, encouraged the public to value the nutrition profession, nor focused on the sustainable development of the nutrition profession. Many programs target public health nutritionists and thus discount the importance of clinical nutritionists, who are essential human resources. As of 2015-2016, statistics show that 82.3% of deceased people who sought treatment for their NCD utilized a government health facility, and 54.5% of the deaths due to NCDs occurred in hospitals or health centres (*Zambia SAVVY Report, 2015-2016*). Hence, they show that many patients in Zambia with a diagnosed NCD, at one point, interacted with a clinical nutritionist in the hospital setting. Therefore, if we are to ever fully address the burden of NCDs and ensure better patient outcomes, skilled clinical nutritionists are needed. At the same time though, in recent years the government (specifically the MoH and HPCZ) has been making strides in the positive direction in terms of increasing training programs, offering more higher education degrees in nutrition, and revising the definitions of the different specialties in nutrition (such as the distinction between a nutrition technician and nutritionist). These initiatives will, with certainty, contribute to the development of the nutrition profession.

However, there is still a lot to be done, which is evident by the gaps that currently exist within the profession. Currently, there is a lack of understanding of the specializations within the profession by the government, the general public and other health professionals. Additionally, there is inadequate opportunities for clinical practical experience, for university and diploma students, lack of understanding of the role of nutrition professionals in a clinical setting, lack of incentives to encourage the public to consult clinical nutritionists, lack of existing pay-grade difference between nutrition professionals according to their level of training, and lack of enough training instructors within institutions. In conclusion by filling the current gaps in the profession highlighted above, nutrition professionals would be more skilled and equipped to produce better patient outcomes with regards to malnutrition and NCDs.

**Objective 1: How do nutrition professionals' practices differ depending on the hospital/clinic where they work and where they got their training?**

In Zambia, there is no standard, nationalized form of screening, assessment, treatment, or evaluation for nutritionists. Therefore, nutritionists practices vary depending on both their current work setting and their training. From interviews that consisted of nutritionists from private, public, and community-level care centers with multiple levels of training, we

were able to highlight some of the important factors that determine the method of practice for nutritionists.

First, the policies of a nutritionist's workplace play a major role in how they operate. In some cases, hospitals and clinics directly state which frameworks nutritionists should use to assess their patients. For example, at the Cancer Diseases Hospital, hospital policy dictates that nutritionists use the Subjective Global Assessment (SGA) form for assessing patients.<sup>6</sup> In other settings, nutritionists use a range of practices including the SOAPIE (subjective, objective, assessment, plan, implementation, and evaluation) form, patient-centered consultations, WHO nutrition guidelines, and anthropometric measurements. Most nutritionists use evidence-based frameworks to guide their work; however they may not always update their practices according to new information and innovations in the field, even though it is important to stay up to date with nutritional news in order to have a best practice facility.<sup>7</sup> Regrettably, in some cases, policies directly prevent nutritionists from implementing new global nutritional practices. Nutritionists are required to follow local government policies and request permission to implement new changes, regardless if current policies are outdated. As a result, some nutritionists are unable to follow global standards, even if they work on their own to keep up with nutritional news.<sup>8</sup> It would be beneficial for the government to publish national nutrition standards of practice to ensure that nutritionists throughout the country are using evidence-based frameworks to guide their work.

The funding allocated towards nutrition through hospital budgets is also a crucial role in determining the types of assessments and interventions that nutritionists use, especially in in-patient care settings. When more funds are devoted to nutrition departments, nutritionists are able to provide more high-quality care. It is especially important for patients who are staying in a hospital to receive balanced diets and supplements to ensure that they recover safely and quickly. Adequately trained nutritionists have foodservice skills that enable them to provide nutritious in-patient meals as well as therapeutic diets, however, funding can be a great limiting factor. For example, in the case of Cancer Diseases Hospital, a lack of funding means that nutritionists sometimes have to request for patients to buy their own supplemental feeds.<sup>9</sup> If patients and their families are unable to pay for these supplements, the recovery process could be slowed or even halted without these essential nutrients. For patients with conditions that prevent them from feeding normally,

<sup>6</sup> Interview with anonymous nutritionist, 3 July 2019

<sup>7</sup> Interview with Sally Bell-Cross, 16 July 2019

<sup>8</sup> Interview with Sally Bell-Cross, 16 July 2019

<sup>9</sup> Interview with anonymous nutritionist, 3 July 2019

techniques such as parenteral and enteral feeding must be used.<sup>10</sup> These forms of alternative nutrition require more expensive equipment and special feeding formulas which must be funded by hospital or government budgets.

A nutritionists' patient population, which is governed by the hospital and clinic where they work, determines how they practice as well. The sociodemographic characteristics of a patient impact the interventions that a nutritionist is able to prescribe. Those who work in private settings tend to have higher-income patients; in these cases, patients would likely have the financial ability to make drastic changes in their diets. Lower-income patients, on the other hand, may not be able to afford expensive dietary diversity. Based on their patient population, nutritionists must take into account the social factors that control what their patients are able to eat. At the Neri Clinic, the i4Life Nutrition Program provides cooking classes that use only readily available local foods to teach new mothers how to make nutritious, balanced meals for their children.<sup>11</sup> In this scenario, nutritionists successfully considered their patient population and tailored their services to match the needs of the community.

Secondly, a nutritionist's education is important for determining how they practice in the clinical setting. All of the nutritionists interviewed for this paper who were trained in Zambia noted that they did not feel prepared enough to enter the clinical setting after receiving their diploma, but for those who went on and completed their bachelor's degree, they felt more prepared and adequately trained to re-enter their clinical practice. Though nutritionists are considered qualified to enter clinical practice after receiving their diploma, the classes in this program are dedicated to food science and the theory of nutrition and there are no opportunities for clinical internships. Thus many people feel unprepared, uneducated, and lacked confidence when they immediately entered the workforce. In some cases, when new graduates from this program enter hospitals and clinics, they are able to learn clinical skills from more senior nutritionists and other health professionals. In other cases though, graduates are placed into inaugural positions or positions meant to be filled by dietitians with no framework, job description, or senior nutritionists to help orient them to the job.<sup>12</sup> As a result, most nutritionists graduating from the diploma program reflect on their clinical skills as inadequate when they first entered the workforce. Their practical training, therefore, depends heavily on whoever they find as mentors and their own trial and error processes. With this highly variable form of practical training, it is understandable how there can be so much dissonance among methods of

<sup>10</sup> Enteral feeding refers to the delivery of nutrients through the gastrointestinal tract via normal oral diet, liquid nutrients, or tube. Parenteral feeding refers to the delivery of nutrients through a vein.

<sup>11</sup> Interview with Sally Bell-Cross, 16 July 2019; interview with Joyce Makasa, 16 July 2019

<sup>12</sup> Interview with anonymous nutritionist, 12 July 2019

practice for nutritionists.

Those who continued their education to receive higher level degrees in nutrition explained that their practices, knowledge, and skills all greatly improved after each additional degree. However, even in nutrition bachelor's degree programs, the focus is on nutrition theory rather than clinical skills.<sup>13</sup> The content for both bachelor's and diploma degrees tends to be focused on the academic side of nutrition, rather than practical. Clinical applications of knowledge are therefore regularly overlooked in classes and curriculums; only three months (specifically three to six hours per week over the course of three months) of clinical internship is required during the five-year Bachelor of Science offered by UNZA.<sup>14</sup> Those who receive a bachelor's degree develop nutrition practices that are based off of a deeper conceptual knowledge of nutrition, though, once again their practical skills can vary based on where and from whom they receive practical training. Additionally, some individuals who receive a diploma or bachelor's degree in nutrition in Zambia choose to continue their education in international settings. Those who received training internationally noted how their programs outside of Zambia provided them with many more opportunities for practical learning and clinical internships.<sup>15</sup> Thus, comparatively, internationally trained dietitians and nutritionists felt more equipped and confident to practice in the clinical setting.<sup>16</sup>

## **Objective 2: What are current and past nutrition interventions implemented by the government and nutrition professionals, respectively?**

Based on our literature review, we found that while the government has demonstrated that they value improvements in the country's nutrition status, their programs have mostly been focused on public health nutrition.<sup>17</sup> Clinical nutritionists have not been integrated into these government interventions, and thus have lost out on advocacy opportunities for the profession.

In clinical settings, nutrition professionals implement patient-specific interventions to managing malnutrition and NCDs. In in-patient settings, nutritionists tend to focus on providing supplemental nutrition and balanced diets. Usually, all patients who enter a hospital will be screened to determine their nutritional status and whether or not they

<sup>13</sup> Interview with anonymous nutritionist, 12 July 2019

<sup>14</sup> Interview with anonymous nutritionist, 12 July 2019; interview with Joyce Makasa, 16 July 2019; comment from Fathima Abdoola, 25 July 2019

<sup>15</sup> Interview with anonymous nutritionist, 12 July 2019; interview with Fathima Abdoola, 10 July 2019

<sup>16</sup> Based on observation and shadowing of nutritionists

<sup>17</sup> See Literature Review and Appendix Table 4 for more details on government nutrition programs and interventions

require supplemental nutrition. In-patient nutrition interventions vary based on a patient's condition, health status, and medications, and are meant to ensure that patients have a full variety of nutrients, vitamins, and minerals. Often, nutritionists work directly with the hospital food service department to ensure that the regular meals provided to patients are balanced and nutritious. When patients require additional nutritional supplementation, hospital nutritionists provide therapeutic diets such as HPHE (high protein high energy diets) or renal diets. In more complicated cases where patients are unable to eat food orally, nutritionists can use enteral or parenteral feeding methods.

Nutritionists who work in out-patient settings will usually treat cases of malnourishment or NCDs such as diabetes or hypertension. In these scenarios, nutritionists use counselling and education to ensure that their patients follow an effective diet to manage their condition. If nutritionists notice a sharp decline in nutrition or health status, they can then encourage patients to be admitted to a hospital. Especially in out-patient settings, nutritionists expressed how there may be challenges in monitoring and following up with their patients after their initial visit. Patients may think that they are prepared enough to manage their own diet, they may not understand the importance of learning more about nutrition, they may not see the benefit of having their nutrition status checked by a professional, or (since most insurance companies do not cover visits to nutritionists) they may not have the money to return for a follow-up visit.<sup>18</sup> In order to combat this issue of following up with patients, the Neri Clinic's i4Life nutrition program has implemented a weekly community outreach strategy in which nutritionists and community health workers (CHWs) go door-to-door, offering nutrition check-ups and encouraging patients to attend their clinics.<sup>19</sup>

Generally, clinical nutrition interventions and treatments in Zambia concentrate on addressing nutrition issues only after conditions arise; there are few preventative nutrition care and education programs.<sup>20</sup> For example, pregnant women frequently do not receive nutrition-focused antenatal care, individuals predisposed to diabetes are not encouraged to see nutritionists early, and communities that are food-insecure are not provided with information on how to achieve a balanced diet.<sup>21</sup> Preventative care is of "good value (costing less than \$50,000 to 100,000 per Quality Adjusted Life Year)" and is a useful method for providing nutrition interventions and would be especially helpful in preventing cases of malnutrition from developing into NCDs (Neumann PJ, Cohen JT, 2009).

<sup>18</sup> Interview with Fathima Abdoola, 10 July 2019

<sup>19</sup> Interview with bell-Cross, 16 July 2019; interview with Joyce Makasa, 16 July 2019

<sup>20</sup> Interview with Pharoah Banda, 15 July 2019

<sup>21</sup> Interview with Fathima Abdoola, 10 July 2019; interview with anonymous physician, 11 July 2019

Good dietary and behavioral choices are crucial in maintaining good health and preventing malnutrition and NCDs (World Cancer Research Fund International, 2014). However, currently frameworks are not in place to educate the public on nutrition, so such preventative care strategies are difficult to implement. If more focus was placed on clinical preventative care, nutrition statistics in Zambia would likely improve and nutrition interventions would be more effective.

### **Objective 3: Are nutrition interventions in Zambia feasible and effective?**

Though nutritionists have been working to improve patient outcomes and the government has been creating numerous public health nutrition programs that should be improving the nutrition status of the country, the rates of stunting, wasting, and underweight have not been improving.<sup>22</sup> The consensus of our interviewees supports this statement: nutrition interventions in Zambia are theoretically feasible, but they are not yet effective.

In our discussions on the feasibility and effectiveness of these interventions, our stakeholders provided a variety of explanations as to why effectiveness is so low, regardless of theoretical feasibility. First, most cited funding as a concern. All public hospitals and clinics receive some sort of government funding, but frequently, it is not enough to implement effective interventions. Likely, this is due to a low prioritization of nutrition programs, which is visible in the lack of health and nutrition funding in the government budget (*2018 Budget Address*). Though the government has frequently asserted that nutrition is important in documents such as the Zambia National Health Strategic Plan for 2017-2021, many nutrition professionals feel that the government does not fully understand the role of nutrition professionals and realize what benefits nutrition-focused interventions could provide for the fight against malnutrition and NCDs.<sup>23</sup> Without the government's full monetary support and power to prioritize the issue, it has been difficult for nutritionists to create and implement effective intervention strategies.

Secondly, in order for nutritionists to implement effective interventions, they must collaborate well with other health and medical professionals. In some contexts, nutritionists, doctors, and nurses have a great mutual appreciation and respect for each other. This allows partnerships to flourish and helps nutritionists, doctors, and nurses work together to create specially tailored treatment plans that are suited for their patients. However, in other cases and health settings, some friction and disunity (seemingly rooted in a lack of understanding and appreciation for nutritionists) exists between nutritionists

<sup>22</sup> See Appendix Figure 2

<sup>23</sup> Interview with Pharaoh Banda, 15 July 2019; Interview with anonymous nutritionist, 12 July 2019; interview with Sally Bell-Cross, 16 July 2019;



and doctors and nurses. Nutritionists who work in these settings struggle to get referrals, explain their role to doctors and nurses, and prove that their knowledge is unique and useful in the clinical setting.<sup>24</sup> When nutritionists have to spend extra time proving their worth to other health professionals, they have less capacity to develop interventions that are effective. Additionally, when health professionals don't consult nutritionists, the signs of malnutrition may be overlooked and patients may lose the opportunity to receive a helpful nutrition intervention, therefore contributing to low levels of effectiveness for nutrition interventions.

Finally, in order for nutritionists to implement effective nutrition interventions and techniques, they must be properly educated and trained. As explained by a clinical nutritionist and current lecturer at UNZA, "nutrition interventions are not effective right now because the people on the ground do not have the knowledge and skills required."<sup>25</sup> Many nutritionists have described how both diploma and bachelor's degree programs in Zambia did not leave them prepared enough to confidently enter the clinical setting.<sup>26</sup> Without clinical internships during education, many nutritionists are left to learn how to apply the nutrition theory they were taught in school during their first few months or years in the workforce. By integrating clinical education earlier, universities could standardize the skill sets that are taught and make sure that all nutritionists learn how to use the most effective intervention strategies. Additionally, there are few professional development opportunities available for nutritionists who are already in the workforce. More conferences, newsletters, and classes geared towards professional development could ensure that all nutritionists are knowledgeable and up to date on how to effectively implement successful interventions.

#### **Objective 4: What changes would nutrition professionals want to see in their profession and its involvement in the health sector?**

Many of the changes that nutrition professionals want to see in their profession stem from the gaps highlighted in our literature review. The specific desired changes that interviewees expressed in our interviews and observations were: adding practical aspects into current training programs, introducing a pay difference between diploma and bachelor degree holders, encouraging more institutions to offer the bachelor's degree in nutrition and food science, revamping NAZ so that it provides a sense of community for nutrition professionals, increasing an appreciation and understanding of clinical nutrition, including

<sup>24</sup> Interview with Fathima Abdoola, 10 July 2019; interview with Joyce Makasa, 16 July 2019

<sup>25</sup> Interview with Anonymous nutritionist, 12 July 2019

<sup>26</sup> See Objective 1 for further discussion on nutrition education

nutrition consultations in health insurance packages, and introducing a national standard for nutrition assessments and screening. All these changes are needed and vital to the development of the nutrition profession.

The practices of nutrition professionals in Lusaka, Zambia differ according to the level of education and whether they were trained domestically or internationally.<sup>27</sup> Many domestically-trained nutritionists state that they felt unprepared to carry out their expected roles in clinics and hospitals upon graduating from their diploma or bachelor's degree. This is because the training in these programs is heavily based on theory, rather than practical skills. The sense of inadequacy and their lack of confidence in their skill-set is recognized by other health professionals in the clinical setting, and consequently affects how these other health professionals interact with and perceive them. Additionally, due to the absence of significant practical experience integrated into the training of nutrition professionals, nutritionists may not be able to meet objectives set forth by the government and be effectively involved in government nutrition interventions. Furthermore, this lack of practical skills affects the extent to which nutrition professionals can produce positive patient outcomes within their clinical settings. To echo this, one clinical nutritionist stated that she is genuinely unimpressed and saddened by how she handled certain cases that she received during her first clinical practice.<sup>28</sup>

The most popular diploma program in nutrition in Zambia is through NRDC, an agriculture-focused institution. Accordingly, the coursework for this program is heavily based on agriculture and lacks the clinical aspect of nutrition, even though many of its graduates do go on to pursue clinical work. This increases the proportion of nutrition professionals who do not have adequate practical skills that are applicable to the clinical setting. Many of our interviewees expressed that 'sometimes you simply learn on the job.' While, in theory this should not be the case, this is common because the current system does not allow them to adequately gain practical skills before they conclude their training. With minimal opportunities for practical training, many nutrition professionals are forced to simply learn whilst in their work setting. To further emphasize this, Joyce Makasa, a graduate from UNZA, stated that (due to a lack of staff that year) during her training there was no instructor to teach the clinical aspect of nutrition to the students, herself included, who chose the clinical path.<sup>29</sup> Despite this, many students who graduated from this program were placed into clinical settings by the MoH. Therefore, the unmet human resource capacity can be attributed to the deficit of practical training programs for students

<sup>27</sup> See Objective 1

<sup>28</sup> Interview with anonymous nutritionist, 12 July 2019

<sup>29</sup> Interview with Joyce Makasa, 16 July 2019

pursuing the nutrition track and the lack of instructors for these training programs.

There is a large contrast between the diploma and bachelor's programs in nutrition, beyond the length of the courses (three and five years, respectively). These two programs differentially prepare students, and often graduates of the diploma program do not feel ready to enter the clinical setting. One current nutritionist described the NRDC diploma training as rather basic and with no practical component for her to hone essential skills; therefore, she did not feel adequately prepared for her critical job role as a clinical nutritionist post graduation.<sup>30</sup> Despite the disparity between these two programs, practicing nutrition professionals receive the same salary from the MoH, regardless of their level of education. This creates tensions within the profession because some nutrition professionals argue that they deserve a higher pay grade because of their bachelor's degree. Additionally, this does not give an incentive for nutrition professionals holding a diploma degree to seek further training. Furthermore, although the introduction of bachelor's degrees in Zambia was a significant contribution to the nutrition profession, once these graduates entered the workforce, diploma holders with years of working experience were suddenly considered lower in the unspoken hierarchy of the nutrition profession. A representative from the MoH stated that the reason why there is no pay difference according to the level of education of nutrition professionals is that Zambia has only recently started offering bachelor's and master's degrees in nutrition. Therefore, introducing a pay difference would not benefit domestic, Zambian nutrition professionals because many of the bachelor's and master's degree holders are internationally trained. This MoH representative further emphasized this by stating that the system is built in order to protect and benefit Zambians, and until there are adequate institutions in Zambia offering the bachelor's and master's degrees, the pay will remain the same between different nutrition degree holders.<sup>31</sup> However, there has been a number of cohorts that have graduated from BSc programs in Zambia, and the MoH has yet to say how many graduates is significant enough to call for this change. In addition, despite the differences between the bachelor's and diploma courses, all nutrition professionals are expected to offer the same level and quality of care in their clinical practice, regardless of the specialization. This expectation emphasizes the lack of understanding of the different specialties within the nutrition profession by government regulatory bodies. It is encouraging to see the government try to come with ways to mitigate this big difference between the diploma and bachelor's training programs: as disclosed by the MoH representative, there is a bridge program for diploma degree holders currently in the workforce being developed that could help enhance their education in the clinical aspects

<sup>30</sup> Interview with anonymous nutritionist, 12 July 2019

<sup>31</sup> Interview with anonymous MoH representative, 18 July 2019

of nutrition. Additionally, there is work being done on changing government policies to resolve the unrest regarding pay rates (specifically this is included in the LMMU syllabus for the nutrition and dietetics degree that is yet to start).<sup>32</sup>

Despite the fact that many nutrition professionals agree that they are exposed to minimal clinical practice during their training, there are very limited opportunities for professional development upon graduation. This is an area of concern for which many nutrition professionals stated that NAZ should take a lead. An executive board member of NAZ admitted that the organization does receive a number of invitations to workshops, meetings, conferences and national events, however these invitations are more available to members who live in Lusaka because outreach is currently still a challenge for the association due to it having inadequate funds. Additionally, the association organizes training workshops for members for professional development, though these are not frequent because of limited resources.<sup>33</sup> Additionally, some nutrition professionals stated that they usually simply read WHO guidelines or other nutrition-related literature in order to stay up to date with the nutrition field. However, sometimes, even the act of finding evidenced based clinical nutrition guidelines online is difficult because some nutritionists do not know exactly where to find them.<sup>34</sup> Conferences and workshops catered towards nutrition professionals would not only provide them with a resource for professional development but also promote cohesion within the profession.

Furthermore, many nutrition professionals expressed that there is a need for a standardized for nutrition screening and assessments at a national level in order to ensure that all nutrition professionals offer the same level of service. As of now, the evidence-based frameworks used by nutrition professionals in the clinical setting is dependent on where they got their training and their clinical or hospital setting. While most methods for screening and assessing patients are similar, nutritionists' interpretations and the interventions they implement differ slightly. This emphasizes the need for a national standard for nutrition assessments. In addition to introducing national standards, nutrition professionals have been advocating for the inclusion of nutrition consultations in health insurance plans. Currently, not many health insurance plans that are accepted in private hospitals and clinics cover nutrition consultations. Therefore, with an added financial burden, individuals are less likely to visit out-patient nutrition services. In regard to public hospitals, more funding should be provided by the government to cover all patient needs such as supplemental and therapeutic feeds (such as HPHE and renal diet). In conclusion,

<sup>32</sup> Interview with anonymous MoH representative, 18 July 2019

<sup>33</sup> Interview with Augustine Kaunda, 18 July 2019

<sup>34</sup> Comment from Fathima Abdoola, 25 July 2019

there are many gaps and desired changes in the nutrition field that professionals highlighted during our interviews and observations; these need to be resolved if nutritionists are to adequately and effectively carry out their practices within Zambia.

**Objective 5: How are nutrition professionals viewed by the health field, the government, and the public, within Zambia? How does this impede or positively affect the extent of their contribution?**

How nutrition professionals are viewed and perceived by other health professionals, the government, and the public is extremely important. The way in which nutritionists are viewed by other health professionals affects their relationships in their work settings, the number of referrals they get, how they conduct their practice, and to what extent patients benefit from their services. Many nutritionists feel unappreciated by other health professionals in their work settings, and explain that some (usually doctors and nurses) feel like they can carry out the work of nutritionists. As a result of this, many nutritionists are pushed to the side in clinical settings. When other health professionals do not seem to value their presence, nutritionists described how they felt that they had to constantly prove themselves. This counterproductive dynamic between nutritional professionals and other health professionals sometimes exists even during students' practical internships in university.<sup>35</sup> Additionally, when doctors and nutritionists do not have good relationships, nutritionists are less likely to receive referrals from doctors. One of our interviewees even admitted that some doctors, including himself in the past, were sometimes not receptive to nutrition because they prefer to use medications.<sup>36</sup> The two physicians we interviewed both stated that they do not directly work with nutritionists, but rather, simply refer patients to them, most commonly just for cases of malnutrition and NCDs. On the other hand, some nutrition professionals, generally those working in public hospitals or community level clinics, have great relationships with other health professionals. In cases like these, nutritionists get referrals often, doctors and nurses value their contributions, and some nutritionists even work directly with other health professionals on patient cases. These relationships developed over time though, and nutritionists in these areas can remember the same feelings of underappreciation that private nutritionists expressed to us. Fathima Abdoola emphasized the dynamic between nutrition professionals and other health professionals by stating that "doctors who value your presence within the hospital will refer patients to you, those who do not, won't."<sup>37</sup> Therefore, though doctors certainly value nutrition interventions, it is questionable whether they value the presence of nutrition professionals.

<sup>35</sup> Interview with Joyce Makasa, 16 July 2019

<sup>36</sup> Interview with Dr. Noor, 11 July 2019

<sup>37</sup> Interview with Fathima Abdoola, 10 July 2019

Nutrition professionals have expressed that the government (specifically HPCZ and MoH) has indeed been making efforts with regard to the nutrition profession, and both advocates for and is receptive to nutrition interventions. However, there is still a lot to be done. Some nutrition professionals stated that the government does not fully understand nor realize the breadth and specializations within the nutrition field. Lastly, with regards to NAZ, one current member stated that despite their work with HPCZ, NAZ does not get the level of respect from HPCZ that it deserves as a professional association.<sup>38</sup> However, with all this data, we could not come to a conclusive statement that indicates how the government truly views nutrition professionals, since the data we collected was focused on how nutrition professionals think the government perceives them. Though we were able to interview one representative from the MoH, this individual can not speak for the views of the government as a whole. Additionally, we were unable to interview a representative of HPCZ, though this would likely have provided great additional insights.

In terms of the public's perspective on nutrition, nutrition consultations are generally seen as an added or unwanted financial burden that is not exactly needed. Through reading different newspaper articles, we came to the understanding that some Zambians equate quantity of food to nutrition and nutrition to the financial status of an individual. Therefore, some Zambians think the more one eats, the healthier one will be. This is not necessarily true: if the quality of food consumed is not up to par, then one's nutrition status will not be either. Wilbroad Zimba, a clinical nutritionist and media advocate, further stated that sometimes he has to remind radio and TV program producers that nutrition professionals are essential in any program concerning health.<sup>39</sup> Previously, health programs have been dominated by doctors, nurses and other health professionals, and so this showed a need for larger media presence of nutritionists. Overall, the public might have misconceptions of what nutritious food really means, and perhaps may not see the importance of a nutritionist in a health oriented program. However, we can not fully state how the public perceives nutrition professionals because we could not directly interview members of the general public based on our ethical clearances. All the conclusions regarding how the public perceives nutrition professionals are based on how nutrition professionals think the public perceives them and our speculations based on newspaper articles. In conclusion, it does not matter whether other health professionals, the public and the government perceive nutrition professionals in the ways listed above, what is truly important is how nutritionists think these three bodies perceive them, because in one way or another this affects how nutritionists practice.

<sup>38</sup> Interview with anonymous nutritionist, 12 July 2019

<sup>39</sup> Interview with Wilbroad Zimba, 9 July 2019

## Conclusions and Recommendations

In recent years, Zambia has experienced a rise in NCDs and continuously high rates of malnutrition; addressing this new double burden of disease is a health priority for the country. Research has shown that, among many negative physiological consequences, malnutrition is in fact related to the development and exacerbation of NCDs. As a result, since diet is important for preventing malnutrition and therefore NCDs, nutrition interventions are crucial for improving patient health and national health statistics. In order to implement these interventions and fight this double burden of disease, Zambia requires skilled set nutritionists and dietitians.

Our research has highlighted the role of nutrition professionals in improving health outcomes and has outlined many of the challenges and barriers that they encounter in the process. The government, public, and health sector all agree that nutrition interventions are important for improving health; however, our stakeholders expressed that while theoretically feasible, nutrition interventions have not been effective in Zambia. A lack of focus on and understanding of the profession by the government, public, and health sector has made it difficult for nutritionists to make tangible impacts. Based on our research, a few important changes would help to develop the role of nutrition professionals and improve the effectiveness of nutrition interventions.<sup>40</sup>

First, a shift in attitudes is required: currently, many do not appreciate and see the importance of nutritionists because they do not fully understand what potential improvements nutrition interventions can offer. Some of our interviewees have been working to change this through hosting continued medical education sessions for doctors, lobbying for government programs and policies, and increasing the positive media presence of nutrition. All of these efforts are important and should be continued in order to advocate for the nutrition profession. Additionally, if education programs for nutritionists were scaled up in Zambia, nutrition interventions would likely be more effective. Many nutritionists who were trained in Zambia cited how their education, especially diploma degree programs, did not offer them enough preparation to confidently enter the workforce. In most cases, they described their education as focusing mainly on nutrition theory rather than practical skills. In recent years, higher education opportunities in nutrition, such as new bachelor's degree programs, have been increasing; however, improvements could still be made. Our stakeholders highlighted a need for more clinical internship opportunities, more accessibility to professional development activities and

<sup>40</sup> See Appendix Table 5 for a full list of recommendations

nutrition news, and a framework to facilitate regular communication between nutritionists throughout the country. Furthermore, there is an absence of standardization in regard to nutrition practices. Policies calling for national regulation of practices would help to ensure that all nutritionists used evidence-based methods based on international standards to assess, treat, and evaluate patients. The Nutrition Association of Zambia has a unique position allowing them to advocate for the profession. However, advocacy efforts by NAZ have been very limited. A lack of government and outside funding, an absence of any full-time or part-time paid positions, and skepticism and negative views of NAZ by other nutritionists have all created challenges. Despite past issues and controversies about the organization, many of our stakeholders cited the need for nutritionists to stand together to advocate for their profession in a group effort. As the only organization run by nutrition professionals for nutrition professionals in Zambia, NAZ has the capability to facilitate this collaboration. In order to do so, however, NAZ needs to be able to revamp the organization, instill a new sense of urgency for advocacy within the profession, and become acknowledged by the government as not just a private entity, but a vital part of the health sector. In addition to playing a crucial role in advocacy, NAZ could also become an association that holds nutritionists accountable beyond HPCZ. This could ensure that all nutrition practices are of the same standard. With these transformations and changes, nutritionists may be able to build upon, reinforce, and enhance their role in the fight against malnutrition and NCDs in Zambia.

## **Limitations**

The limitations in our research tie back to our unanswered questions. Firstly, due to our sampling method (snow-ball sampling), our interview sample was to some extent biased regardless of the data we collected. Additionally, we used online sources (scholarly literature and newspapers) and experts within the nutrition profession to understand the broader public. Therefore, we can not strongly conclude what perceptions the public has about nutrition professionals. Furthermore, as American students, we had very limited prior knowledge of the Zambian context, and had to learn a lot upon arrival; this may limit the applicability of our recommendations. Lastly, with just two months to conduct our research, we were not able to interview or shadow as many nutritionists as we would have liked to ensure that the views of all nutritionists are expressed in this paper. Additionally, due to time constraints, we did not interview HPCZ or other relevant government representatives.



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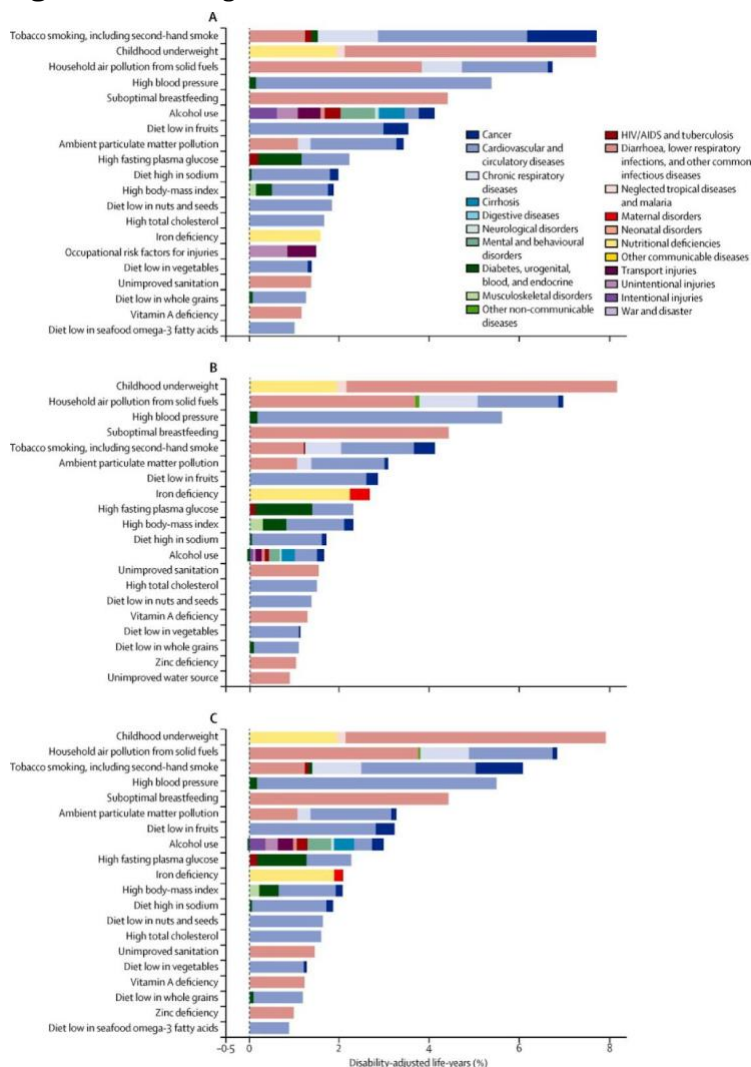
# Appendix

**Table 1.** Nutrition status of Zambia (1996 - 2018)

| Indicator  | 1996 (ZDHS) | 2002 (ZDHS) | 2007 (ZDHS) | 2013-2014 | 2018 (ZDHS) |
|------------|-------------|-------------|-------------|-----------|-------------|
| Stunting   | 42          | 47          | 45          | 40        | 35          |
| Wasting    | 4           | 5           | 5           | 6         | 4           |
| Underweigh | 24          | 28          | 15          | 15        | 12          |

**Source:** National Food and Nutrition Policy, and Zambia Demographic and Health Surveys

**Figure 1.** Linking NCDs to behavioral choices and diet



**Source:** Lim et al., 2012

**Table 2.** Stakeholders Interviewed in June and July of 2019

| <b>Name</b>         | <b>Position</b>   | <b>Organization</b>          | <b>Training</b>          |
|---------------------|---|------------------------------|--------------------------|
| Anonymous           | Not disclosed   | Ministry of Health           | Zambia                   |
| Anonymous           | Physician   | Victoria Hospital            | Not relevant to research |
| Anonymous           | Clinical Nutritionist   | Not disclosed                | Zambia and International |
| Fathima Abdool      | Dietitian   | Various private              | International            |
| Pharaoh Banda       | Clinical Nutritionist   | University Teaching Hospital | Zambia                   |
| Sally Bell-Cross    | Clinical Nutritionist, I4Life Project Manager                         | Neri Clinic, I4Life Program  | International            |
| Augustine Kaunda    | Food Scientist and Nutritionist                                       | NAZ                          | Zambia                   |
| Joyce Makasa        | Clinical Nutritionist Intern  | Neri Clinic, I4Life Program  | Zambia                   |
| Dr. Abucar Noor Ali | Physician   | Not disclosed                | Not relevant to research |
| Anonymous           | Clinical Nutritionist   | Cancer Diseases              | Zambia                   |
| Wilbrod Zimba       | Clinical Nutritionist, Media Advocate, former NAZ publicity secretary | Not disclosed                | Zambia                   |

**Table 3: Code-Book**

| <b>Code</b>                                 | <b>Definition</b>  |
|---|--|
| Government: efforts                         | How the government is trying to develop the nutrition profession in Zambia   |
| Domestically trained                        | Degree/diploma accredited by a domestic (Zambian) institution.   |
| International: secondary training           | Masters and/or postgraduate degree accredited by an international institution  |
| Feelings: upon graduation                   | Whether they felt professionally prepared for the work they did after graduation   |
| Team: dynamic                               | How the clinical team perceives, interacts and welcomes nutrition professionals within the clinic/hospital setting   |
| Changes: profession                         | Changes that nutrition professionals want to see in their profession due to the challenges they face.  |
| Nutrition interventions: effective/feasible | Whether nutrition interventions are feasible and effective in Zambia   |
| NAZ: perspective                            | What nutrition professionals think of NAZ  |
| NAZ: challenges                             | Challenges that NAZ faces that impede their effectiveness as an association.   |
| NAZ: benefits                               | What benefits do non-members and members get from NAZ  |
| NAZ: efforts                                | How NAZ is contributing in the development of the nutrition profession in Zambia.  |
| Professional development                    | Ways in which nutrition professionals stay up to date with nutrition advice/ interventions and learn more about nutrition.   |
| Framework: diagnosis                        | How nutrition professionals diagnose patients.   |
| Government: perspective                     | What nutrition professionals think the government thinks of them and their profession.   |
| Framework: intervention/treatment           | How nutrition professionals provide nutrition interventions/treatments to patients.  |
| Other health professionals: perspective     | How other health professionals perceive the importance of nutrition and nutrition professionals.   |
| Practice                                    | What nutrition professionals do  |
| Advocacy: efforts                           | How individual nutrition professionals try to advocate for their profession and enlighten other health professionals about the importance of nutrition and their profession. |

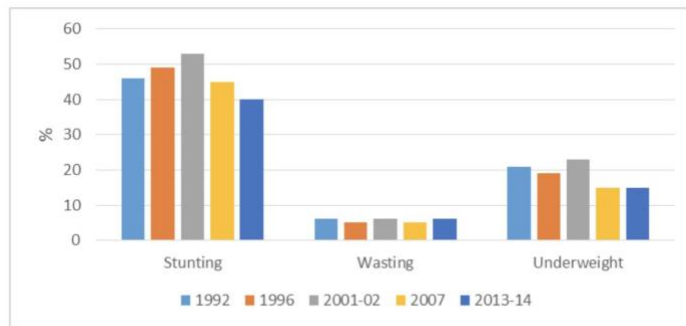
**Table 4. NFNC Programmes as of 2015**

| <b>Title</b>   | <b>Overview</b>  |
|--|--|
| The First 1,000 Most Critical Days Programme           | This three year programme is focused on reducing malnutrition. Specifically, the programme strives to reduce the levels of stunting in children under two years of age from 45% to 35% by  |
| Maternal, Adolescent, Infant and Young Child Nutrition | To guide the implementation of MAIYCN activities of all stakeholders (community health workers; teachers; agriculture extension workers; public health workers; social workers; volunteers and other stakeholders) to contribute towards the reduction of stunting in the First 1000 Most Critical Days (MCDs) |

|   |   |
|---|---|
|   | <ol style="list-style-type: none"> <li>1. To provide standard guidelines on maternal, infant and young child nutrition for health to all key stakeholders.</li> <li>2. To provide standard messages to all key stakeholders so as to promote good nutrition for mothers, adolescents and children.</li> <li>3. To provide standard messages for adolescent's nutrition in</li> </ol>  |
| Management of Severe Acute Malnutrition | The main objective of the programme is to contribute to the reduction of under-five mortality rate by adequate management of severe-acute malnutrition in hospital and community settings using the WHO guidelines.   |
| Nutrition in Emergencies                | <p>By the year 2015 technical capacity in food and nutrition emergency preparedness and response will have been enhanced. Specific objectives:</p> <ul style="list-style-type: none"> <li>○ To develop training packages in areas of food and nutrition in the context of emergency preparedness and disaster risk reduction and response.</li> <li>○ To implement training, targeting key stakeholders and key areas of food and nutrition for enhanced emergency</li> </ul>   |
| Nutrition and HIV                       | By 2015, the food and nutrition component in HIV treatment, care and support will have been integrated and strengthened, with special focus on HIV positive pregnant and lactating women and HIV-positive infants and children.   |
| School Health and Nutrition             | The objective of this programme is to improve learning and equity among children attending basic education through integrated health and nutrition interventions. It was hoped that if interventions are well implemented, they could increase enrolment and attendance, reduce hunger and improve nutritional status.  |
| Food and Nutrition Security             | <ol style="list-style-type: none"> <li>1. By 2015, production, access and consumption of food crops, fish and livestock will have been broadened contributing to improved household food and nutrition security and more diverse diets for the Zambian population, especially the most vulnerable groups.</li> <li>2. By 2015, micronutrient deficiencies of iodine, vitamin A, iron and zinc will be reduced to below public health levels among women of reproductive age, pregnant women and children under the age of two years.</li> </ol> |



**Figure 2. Trends in Stunting, Wasting, and Underweight from 1992 to 2013-14**



Source: LCMS and DHS Various years

**Source:** Mukuka, R. M., & Mofu, M. (2016).

**Table 5. Recommendations**

| Recommendation                   | Strategies   |
|----------------------------------|--|
| A shift in attitudes             | <ul style="list-style-type: none"> <li>- Continued medical education sessions for other health professionals that focus on nutrition</li> <li>- Government policies and programs that emphasize the importance of nutrition</li> <li>- An increased positive media presence of the nutrition profession</li> </ul>                 |
| Scaling up of education programs | <ul style="list-style-type: none"> <li>- More clinical and practical internship opportunities for students</li> <li>- Accessibility to professional development sessions and updated sources of nutritional news</li> <li>- Frameworks to facilitate regular communication between nutritionists throughout the country</li> </ul> |
| National standardization         | <ul style="list-style-type: none"> <li>- Government policies that regulate the means by which nutritionists assess, treat, and evaluate their patients</li> <li>- Government programs to ensure that all nutritionists practice using evidence-based frameworks on par with international standards</li> </ul>                     |
| Changes in NAZ                   | <ul style="list-style-type: none"> <li>- Development of one or more paid, full-time or part-time positions</li> <li>- Acknowledgement by the government as a vital part of the health sector, not just a private entity</li> <li>- Becoming an accountability organization for all nutritionists in Zambia</li> </ul>              |