



Master of Philosophy in Development Policy and Practice

Using Quantitative Analysis to identify Binding Development Constraints and Options for their Alleviation-Two Case studies in Health and Vocational Training in Zambia

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Abstract

This report is a quantitative analysis of two case studies demonstrating the binding development constraints and options for their alleviation. The first case study is an analysis of health inequalities which remain an important policy issue in many developing countries. Using the 2014 data for the Zambia Demographic and Health Survey (DHS), the paper assesses health inequality in Zambia using Child stunting as a health variable. The paper finds that those in the poorest group had more than thrice the Child stunting rate of the richest group, proving the existence of health inequality in Zambia. The paper further investigates the factors associated with stunting and finds that the mother's age, education, marital status, socio-economic status, location and nutritional status measured by body mass index (BMI) are significantly associated with Child stunting. Policy recommendations center on women empowerment, improving household food security and rolling out Social Cash Transfer schemes among others.

The second case study is concerned with technical and vocational skills development, which despite being a key factor in economic growth remains limited in Zambia. Using multiple regression, the study finds that participating in skills training is determined by age, level of education, gender and location (rural or urban). These factors also affect participants' choices among the various skills training options that exist in Zambia: on-the-job training, public institutions, private institutions and apprenticeship. The study provides a number of recommendations. One relates to improved access to education for girls to improve their chances of accessing skills training. Another one calls for the formalisation of apprenticeships which remain informal and unofficial despite a substantial proportion of people acquiring skills through this avenue.

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Dedication

To my beautiful wife Mutale and my handsome son Lubuto

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Chapter One

Two important issues in Zambia's social and economic development have been considered in this paper. These are health and technical and vocational skills development. Though not directly related and while occurring at different times, and affecting the country in different ways, both of these issues remain critical to the development of Zambia. Health, which is not only a state of physical well-being, but also psychological well-being, is an important aspect of human capital and necessary for a productive economy. For this reason we use child stunting as a proxy indicator to assess health inequality in Zambia. We establish that disparities in access to health care between rich and poor are wide and should be addressed.

We then turn to the issue of technical and vocational skills training and assess the determinants of participating in skills training as well as the various avenues that exist for receiving training. We establish that rural areas remain systematically disadvantaged when it comes to accessing skills training. Gender also remains an important determinant of participation in skills training in Zambia. Girls especially remain systematically discriminated as far as skills training is concerned. We also note that while informal apprenticeship remain a major source of skills training in Zambia, it has not received any attention unlike in many countries especially in West Africa and thus remains informal and unrecognized.

The use of quantitative methods, particularly econometric models help to provide a sufficient basis for arguing out the trends observed on the two case studies. Both of the case studies are also preceded by detailed review of literature to make the conclusions comparable to similar studies undertaken in other parts of the world.

The conclusions of each of the case studies make important observations that can be used for policy discussions and consideration. While acknowledging methodological limitations in some cases the results of each of the cases are robust enough and compare favorably to similar studies conducted in other parts of the world. In some instances important insights have been raised which point in the direction of further research to come up with more conclusive answers.

Chapter Two

i. Introduction

Health inequalities still remain an important policy issue in many developing countries. Different sections of society within and across countries have continued to display wide disparities in health outcomes. The poorest of populations especially, while found among the unhealthiest also face relatively more barriers to health care and other privileges that would improve their health and general well-being. Even after 15 long years of the Millennium Development Goals, the poor and other less privileged groups continue to remain worse victims of various health conditions. Where progress has been made on the MDGs, there are still traces indicating that gains were concentrated in more privileged groups than the less privileged. The publication of the report by the WHO Commission on Social Determinants of Health in 2008 (World Health Organisation 2008) recognize the existence of various health inequalities within countries and how they affect the health outcomes of various sections of society:

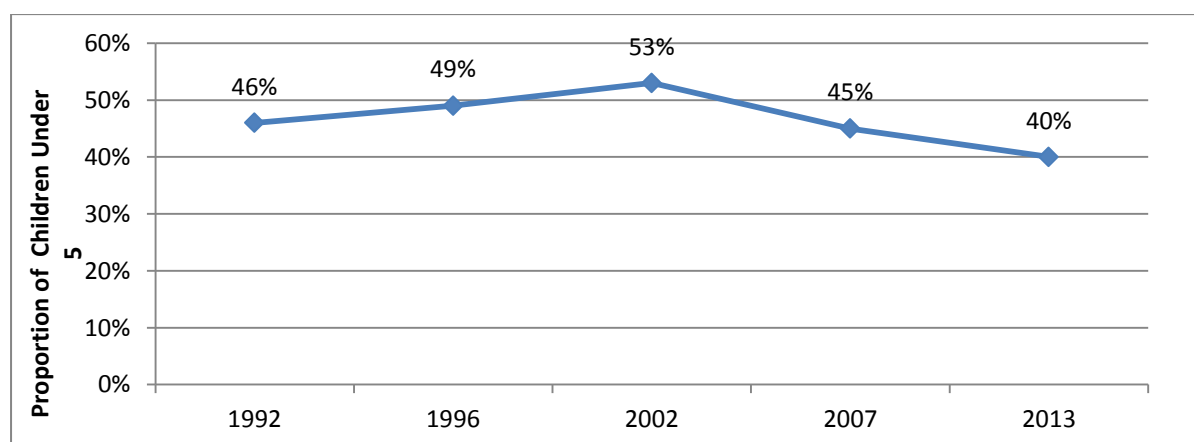
- Infectious diseases and undernutrition continue to affect the poor more than their richer counterparts within countries.
- As countries become more urbanized, population health problems are being reshaped especially among the urban poor who are now living at higher risk of non-communicable diseases than their richer counterparts as a result of changing food consumption patterns, increased injuries from accidents and violence.
- Health-care systems are also appallingly weak in many developing countries, with massive inequity in provision, access, and use between rich and poor.

Based on the foregoing, this study seeks to investigate the extent of health inequalities in Zambia using child stunting as an indicator. Stunting or 'height-for-age' reflects failure to receive adequate nutrition over a long period of time and can also be affected by recurrent and chronic illness. It represents the long-term effects of undernutrition in a population and is not sensitive to recent, short-term changes in dietary intake (Central Statistical Office 2014). Stunting as an indicator is embedded within MDG 1, target 1 C which sought to **'halve,**

between 1990 and 2015, the proportion of people who suffer from hunger' (United Nations Development Programme 2013). Poverty therefore remains one of the main underlying factors to ending child stunting and other child nutrition issues. The poor generally lack access to food and other nutritional requirements that would help them avoid having stunted children. Eliminating extreme poverty therefore remains key to eradicating child malnutrition. Nonetheless, poverty remains widespread in Zambia and the pace of poverty reduction seems to be too slow for the country to have achieved the target of eliminating extreme hunger. Poverty still remains high with 60.5% of the population surviving on less than US\$1/day in 2010 and more than 40% living in extreme poverty in the same year, unable to meet daily food needs (Central Statistical Office 2012).

Stunting has been declining in Zambia, albeit at a very slow rate. Over a period of more than ten years, stunting has only declined by about 6 percentage points, from 46% in 2002 to 40% in 2014 (Central Statistical Office 2014). This is despite many initiatives and campaigns to end the vice under the MDGs. The current pace of reduction unfortunately mean that it will take much longer; may be 5 decades before stunting can be eliminated completely. Meaning that for many years to come, more and more children will live at the risk of being stunted which has implications for their future growth and development further reducing their chances of escaping the poverty trap in which many find themselves.

Figure 1: Trends in Child Stunting, 1992 to 2014.



Source: authors own construction using the 2014 ZDHS report.

The MDGs which prioritised stunting as a problem came to an end on December 31st 2015. Despite this, stunting and other child nutritional indicators still remaining high. This means that efforts have to continue nonetheless. Fortunately, the Sustainable Development Goals (SDGs), which redefines the new global development agenda also seeks to *'end, by 2030 all forms of malnutrition, including achieving, by 2025, the internationally agreed¹ targets on stunting and wasting in children under 5 years of age...'* (United Nations 2014). Thus, stunting remains one of the major indicators of population well-being to be assessed in Zambia and many countries for the next 15 years. On this basis it is imperative to understand how stunting is distributed among different socio-economic groups. This is important in strategizing for the achievement of this particular target under the SDGs.

ii. **Rationale of the Study**

Understanding the extent of health inequality is key for policies that seek to reverse the situation. It is also important for achieving set targets of global development agendas such as the MDGs and SDGs. While acknowledging the presence of health inequalities within and across countries the WHO Commission on Social Determinants of Health point out that to reverse inequalities the aim for all countries should be to try and bring the worse off up to the level of the best. However, this would be impossible if there is no clear evidence to highlight the extent of inequality across and within countries. Evidence that brings to light the marginalised groups, their characteristics in terms of where they live and what they do as well as the health aspects in which they face marginalisation becomes essential in designing policies aimed at changing their plight. This makes this study of utmost importance to Zambia and other countries facing similar challenges. The study is also timely as it comes at a time when countries have just domesticated the SDGs and making plans for how to accelerate progress from the start having drawn lessons from the just ended MDGs marathon. The information to be highlighted by this study could be a basis for development policies that seek to end health inequalities in Zambia. While the study focuses on only one health variable, the findings are indicative of what might be obtaining in other health attributes in the country.

¹ At a UN general assembly in 2015 heads of states of countries agreed on the Sustainable Development Goals which supersedes the Millennium Development Goals and sets an agenda for the next 15 years.

Nonetheless, merely knowing the rich-poor distribution of a health variable may be limited. The study goes further to analyse the characteristics of households associated with stunted children in this case. Again this is important for targeting of various programmes that aim at accelerating the reversal of inequalities and achievement of development goals. It is envisaged that this information is not only useful in explaining MDG failures and successes since 1990 but also in preparing for the future of Zambia's development and especially the achievement of SDGs.

iii. Literature Review

The publication of the report by the WHO Commission on Social Determinants of Health (World Health Organisation 2008) can be said to be the hallmark of recognizing the existence of health inequalities within countries and how they affect the health outcomes of various sections of society. The report notes key issues, pointing out the existence of health inequality and their causes at different levels of society that impede progress towards achieving the MDGs. Some of the issues can be summarized as follows:

- Infectious diseases and undernutrition continue to affect the poor more than their richer counterparts within countries. As countries become more urbanized, population health problems are being reshaped especially among the urban poor who are now living at higher risk of non-communicable diseases than their richer counterparts as a result of changing food consumption patterns, increased injuries from accidents and violence.
- Health-care systems are appallingly weak in many developing countries, with massive inequity in provision, access, and use between rich and poor. Universal coverage principle, around which rich countries build their health systems is absent in most poor countries. Universal coverage requires that everyone within a country can access the same range of (good quality) services according to needs and preferences, regardless of income level or social status.
- Urban-led growth approaches have seen rural communities suffer from underinvestment in such things as infrastructure and other social services like health and education, with disproportionate levels of poverty and deplorable living

conditions which contribute in part to the rural-urban migrations in search of better life in urban areas. However, urban life has little to offer given high rates of unemployment, plus congestion in cities as services remain limited against surging populations. There is instead more exposure to disease (both communicable and non-communicable) in urban areas than rural areas which also tend to be more rampant among the poor.

Various authors have further pointed the existence of health inequalities within countries which have important implications for the achievement of MDGs:

Gyorkos and others, while investigating progress towards the MDGs in a community of extreme poverty found local prevalence of underweight in a district to be more than four times greater than national level indicators. The disparities also existed between different regions but also within regions among people of different socio-economic status (Gyorkos, Theresa W., Joseph, Serene A., Casapía, Martin, 2009).

A study in rural Indonesia also found the utilization of modern healthcare systems where qualified health practitioners are employed to be often undermined by poverty as only a small proportion of the population had enough resources to be able to afford it. In a household survey the study also found indigenous people who were more likely to be poor than non-indigenous people facing challenges in accessing health services and medicines (Assan, Joseph, Assan, Samuel, Assan, Nicola, Smith, Lauren, 2009).

In Botswana, the MDGs may be difficult to attain with high out-of-pocket payments especially by the poor. Unlike their richer counterparts poor households continue to face high out-of-pocket payments which impoverish them making it hard for them to make progress towards achievement of MDG targets (Akinkugbe, Oluyele, Chama-Chiliba, Chitalu Mirriam, Tlotlego*, Naomi, 2012).

Jean-Christophe Fotso also note that across countries in Sub-Saharan Africa, though socioeconomic inequalities in stunting do exist in both urban and rural areas, they are significantly larger in urban areas. He adds that the urban advantage in health masks enormous disparities between the poor and the non-poor in urban areas of Sub-Saharan Africa (Fotso 2006)

An investigation of socioeconomic and health disparities in global nutrition earlier found that the poor and relatively disadvantaged sectors of the population who suffered both malnutrition and under-nutrition. The study also observes that while cardiovascular disease incidence has declined in industrialized countries, it is less so in the poorer socioeconomic strata (Darnton-Hill I 1998).

In a study of 45 developing countries to describe poor–rich inequalities by wealth quintiles in selected health indicators, Houweling et al found huge disparities between the rich and poor, noting that reducing poor–rich inequalities in certain health indicators such as professional delivery care is essential to achieving the MDGs for maternal health (Houweling, Tanja A. J., Kunst, Anton E., 2010).

In South Africa, Silal and others observe that access to obstetric services was impeded by affordability, availability and acceptability barriers which were unequally distributed, with differences between socioeconomic groups and geographic areas being most important. Rural women especially faced the greatest barriers, including longest travel times, highest costs associated with delivery, and lowest levels of service acceptability, relative to urban residents. They recommend that to move towards achieving its MDGs, there is need to improve access in rural areas and for poor women (Harris, Bronwyn, Birch, Stephen, Penn-Kekana, Loveday, Silal, Sheetal, McIntyre, Diane, 2012)

In terms of the factors associated with the nutritional status of children, Reinbold, while investigating Economic Inequality and Child Stunting in Bangladesh and Kenya lists some of

the following: Mother's age, Mother's years of education, Mother's employment status, Household wealth, Household size and location (Reinbold 2011). May and Timaeus identify similar factors but adds race of a mother as another important factor that determined under-five nutrition in a study in South Africa (May, Julian, TimÃ us,lan M, 2014).

A cross country study of child nutrition in Sub-Saharan Africa also found various characteristics of the household to be associated with a child's undernutrition. The authors highlight that household wealth, which was computed using an asset index was an important determinant of child nutrition. Others were location of the household, number of living children in the household, sex, age and the education of the household head (Harttgen, Kenneth, Klasen, Stephan,Vollmer, Sebastian, 2013).

Father's education was also found to be one of the important characteristics determining the nutritional status of a child in Fotso (2006). The author points out that in many developing countries, certain behaviors and practices that affect child health and nutrition are highly dependent on characteristics of the father, especially his level of education. The other variables were the mother's age at birth of the index child, marital status, religion, and nutritional status.

iv. Objectives

In the light of the foregoing the main objective of this study is to assess the distribution of stunted children by socio-economic status in Zambia as a way of assessing health inequality. The study will also investigate the factors associated with child stunting.

Specifically the study will aim to:

- Assess health inequality using the 2013/14 Zambia Demographic and Health Survey using child stunting as the health variable of interest.
- Using a multivariate analysis, assess the factors associated with child stunting at the individual level.

v. Statement of Hypothesis

The study will include the variables listed in this section for the reasons explained. The hypothesis to be tested is also stated for each variable:

1. **Stunting:** stunting, as earlier explained is an important indicator of child well-being. It is useful in the assessment of adequate nutrition, health and development of a child. It is also important in estimating overall nutritional status and health of populations. Prevalence of stunting in a given sub-population is therefore indicative of ill-health of such a population. This aspect makes it relevant to be used as a proxy for measuring health inequality in Zambia. In the 2014 ZDHS, stunting was captured both at the individual and household level as a count of the children whose height-for-age z-score was below -2 standard deviation according to the new WHO guidelines (de Onis, Blössner 1997). In this study stunting has been used to achieve two purposes:
 - i. As a health variable to measure health inequality by assessing its distribution between rich and poor socio-economic groups in Zambia.
 - ii. As a dependent variable to investigate the correlates of stunting

In terms of inequality the hypothesis to be tested is that ***'more cases of stunting are found among poorer groups of society than richer ones'***. This is based on the general understanding that in many instances the poorest of populations are also the unhealthiest that tend to experience more events of ill-health whatever the case may be (Sahn 2012).

2. **Mother's education:** the education of a mother to a stunted child has been used as one of the independent variables to investigate the factors that determine stunting in this many other studies (Abuya, Ciera & Kimani-Murage 2012, Miller, Rodger 2009). Literature is full of evidence pointing to the fact that educated mothers tend to be more advantaged than uneducated mothers when it comes to accessing the necessary requirements needed to raise a healthy child (Miller, Rodger 2009). This can be in form of relative ease of accessing various forms of information related to child health and being able to apply it correctly. Another reason is that educated mothers, unlike the uneducated ones are more likely to benefit from returns to their

education in various forms including having higher chances of being engaged in gainful economic activities that enhance their purchasing power. As some of the aspects of child nutritional need to be purchased this further puts them at an advantage in terms of raising a healthier child. Based on this, the hypothesis to be test is that **'educated mothers are less likely to have stunted children'**.

3. **Mother's age:** the age of a mother of a stunted child affects the prevalence of stunting. Young and inexperienced mothers are more likely to experience more cases of stunting compared to older and relatively more experienced mothers. This is because relatively older mothers may have learnt good practices including issues of child nutrition while raising other children. Young mothers and especially those giving birth for the first time may lack this information. Thus the hypothesis to be tested for this particular variable is that **'Younger mothers are more likely to have cases of stunting compared to older ones'**
4. **Mother's marital status:** the marital status of a mother is associated with child stunting. The hypothesis to be tested in this regard is that **'unmarried mothers are more likely to have cases of stunting than married ones'**. The reasons for this are various: firstly raising a child is a demanding undertaking and a mother may need a supporting hand from someone like a husband or partner to do it successfully. Secondly, in most poor countries, and where the husband is the sole decision maker and provider for the home, their input is cardinal in terms of providing the necessary nutritional requirements for the child. As decision makers, men can also affect the health of a child depending on the quality of decisions made and whether they favor good practices of raising children. The nature and types of support highlighted above may lack for many unmarried mothers who have to rely on themselves alone to raise their children.
5. **Mother's nutritional status (BMI):** A mother's nutritional status, represented by Body Mass Index (BMI) has important implications for the health of her children. Malnutrition in women results is said to reduce productivity, increased susceptibility

to infections, slowed recovery from illness, and a heightened risk of adverse pregnancy outcomes (Central Statistical Office 2014). A woman with poor nutritional status has a greater risk of having a baby with a low birth weight and producing low-quality breast milk among other things. Both of these contribute to the chances of having a stunted child. Thus, the hypothesis to be tested for this particular variable is that **'mothers with relatively higher BMI are less likely to have cases of stunting compared to those with relatively lower BMI'**.

6. **Mother's socio-economic status:** the socio-economic group to which a mother belongs has important implications for child stunting. Literature abounds showing that belonging to a lower socio-economic status is associated with not only stunting but other ill health indicators than belonging to a higher socio-economic status (Miller, Rodger 2009). Depending on the measure of socio-economic status, belonging to a higher bracket is in most cases synonymous with having higher or better purchasing power compared to lower brackets. Meaning that those with higher socio-economic statuses tends to have more and better access to various facilities and services that better enable them to raise healthier children. The hypothesis to be tested for this particular variable is that **'mothers of relatively lower socio-economic status are more likely to have cases of stunting than mothers of higher socio-economic status'**

7. **Location (rural or urban):** where a mother resides has an association with child stunting. Literature shows that Mothers who live in the rural areas are less likely to access most of the necessities that may be required to raise healthy children than those who live in the urban areas. Foods important for children's nutrition such as milk or milk products may not be readily available in the rural areas. In the case of Zambia where rural poverty is as high as 79%, it could be challenging to access some of the foods and food supplements. The hypothesis to be tested for this particular variable is that **'mothers living in the rural areas are more likely to have cases of stunting than those in the urban areas'**.

vi. Methodology

i. Data

Data on stunting, stratified for five wealth groups, was obtained from the Zambia Demographic and Health Survey (ZDHS) conducted between 2013 and 2014. The ZDHS is a nationally representative household survey covering 15,920 households in the 2013-14 rounds. The ZDHS is a multi-country standardized survey which collects information on various aspects of the household. These include household access and use of health services, women and men's health issues as well as children's. The ZDHS also collects information on household ownership of assets.

ii. Measurement of Variables

a. Stunting

Stunting (low height-for-age) is one of the internationally recommended indicators most commonly used to measure children's nutritional status. Stunting is a measure of chronic nutritional deficiency which reflects a failure to reach linear growth potential due to suboptimal health and/or nutritional conditions (de Onis, Blössner 1997). It is also an important indicator of the MDGs as well as the SDGs (United Nations 2014, World Health Organization., 2005). According to the WHO a child is considered stunted if its height-for-age Z-score falls below minus two (-2) standard deviation (SD) from the median of the reference population (de Onis, Blössner 1997). The prevalence of stunting in the population was estimated at the individual level. This was done by calculating the total number of mothers with stunted children and comparing this to the rest of the population.

b. Socio-Economic Status

The ZDHS combines household ownership of durable consumer goods, housing quality, and water and sanitation facilities using principal components-derived weights to come up with an asset index. This is then used as a measure of socio-economic status. This approach is commonly used in similar studies especially in developing countries (Fotso 2006, Harttgen, Kenneth, Klasen, Stephan, Vollmer, Sebastian, 2013). Based on this, five wealth groups or quintiles were constructed such

that each consisted approximately 20% of the survey population. The first quintile represented the population with the lowest socio-economic status while the fifth quintile represented those with the highest socio-economic status.

iii. Measurement of Inequality

The two variables described above were then used to measure health inequality in Zambia using the 2013/14 ZDHS. While there are various measures of health inequality this study opted to use the disparity rate ratio (DRR) which is a measure of a socioeconomic gap, dividing the rate of the least advantaged group by the rate of the most advantaged group. This approach has been used by many authors including by Campbell et al (Campbell, Oona MR, Houweling, Tanja AJ, Kunst, Anton E, Ronsmans, Carine, 2007) in an international comparative study to assess the ‘huge poor–rich inequalities in maternity and child care in developing countries’. A DRR equal to 1 represents the absence of inequality in the population while a DRR greater than 1 represents an increase in ill health amongst the least advantaged group.

The DRR is given by:

$$DRR = \frac{R_i}{R_r}$$

Where R_i and R_r are the prevalence rates of the health variable of interest in the poorest and richest population groups respectively. In this regard R_i is the prevalence of stunting among the poorest population while R_r is for the richest group according to the 2013/14 ZDHS.

The advantage of using the DRR as a measure of inequality is that the calculation is easy to perform and the interpretation is straightforward. The DRR can also be adapted as a relative rate comparing any two socioeconomic groups. Nonetheless, the DRR has an important shortcoming: it can only compare the situation in two groups (lowest and highest ranking) without paying attention to what is happening in between. This weakness has been cited by other authors (Ontario Agency for Health Protection and Promotion 2013). In other words, the study would not focus on the distribution of stunting on those households in the second, third and fourth quintiles. To compensate for this shortfall the study has included

enough descriptive statistics to highlight household characteristics in relation to stunting. Additionally, a probit model was introduced to highlight some of the factors associated with stunting in the population.

iv. Factors associated with stunting

To assess the factors associated with child stunting the probit model was used (Jones 2006). The probit model uses the method of maximum likelihood estimation and therefore the coefficients are interpreted only as qualitative effects. In order to interpret the quantitative implications of the results, partial effects may be computed using marginal effects for continuous explanatory variables and average effects for binary explanatory variables. The probit model can be given a latent variable interpretation as follows:

Let,

$$y_i = \begin{cases} 1 & \text{iff } y^*_i > 0 \\ 0 & \text{otherwise} \end{cases}$$

Where,

$$y^*_i = x_i\beta + \varepsilon_i$$

Where the dependent variable (y_i^*) is binary. It takes the value of 1 if a household has at least one stunted child and a value of 0 otherwise. X_i is a list of independent variables. Also α is the constant and β_i the coefficients being estimated.

Then

$$P(y_i=1 | x_i) = P(y^*_i > 0 | x_i) = P(\varepsilon_i > -x_i\beta) = F(x_i\beta)$$

The log-likelihood for a sample of independent observations is,

$$\text{LogL} = \sum_i \{ (1 - y_i) \log(1 - F(x_i\beta)) + y_i \log(F(x_i\beta)) \}$$

To make the study more informative the analysis includes descriptive statistics to demonstrate the distribution of stunting cases across and within wealth quintiles. The study

also assesses the distribution of stunting by various individual characteristics. The variables used in the probit model are summarised in table 2 below:

Table 1: Variables used in Regression

Variable Name	Variable Definition and Description
Dependent Variable	
<i>Stunting</i>	Binary (1 if a child is stunted, 0 otherwise)
Independent Variables	
<i>Mother's age,</i>	Age in years (continuous)
<i>Mother's marital status,</i>	Binary (1=married, 0=not married)
<i>Mother's years of schooling,</i>	Years of schooling (continuous)
<i>Mothers BMI</i>	Body mass index (continuous)
<i>Socio-economic status</i>	Quintiles are in ascending order i.e. first quintile represents the sub-population with the lowest wealth index.
<i>Location</i>	1=Urban 0=Rural

Source: authors own construction

vii. Results

The results are presented below in two stages. The first stage focuses on the outcomes of the data analysis on health inequality. It is important to state upfront that using the DRR to measure inequality is very simple in terms of calculating and interpretation as already stated. The format of the data used for the analysis could not allow the use of other more complicated inequality measures such as concentration curves or indices of inequality. This notwithstanding, the results are robust enough and brings to light important insights on the unequal distribution of stunting between the poorest and richest groups in Zambia. This section also draws significantly on the actual findings of the ZDHS final report to demonstrate rich-poor disparities in access to certain pre-requisites affecting the prevalence of stunting.

The second part of the results is the outcome of the probit model. This section is very important as it provides descriptive statistics that shed light on the factors that affect the

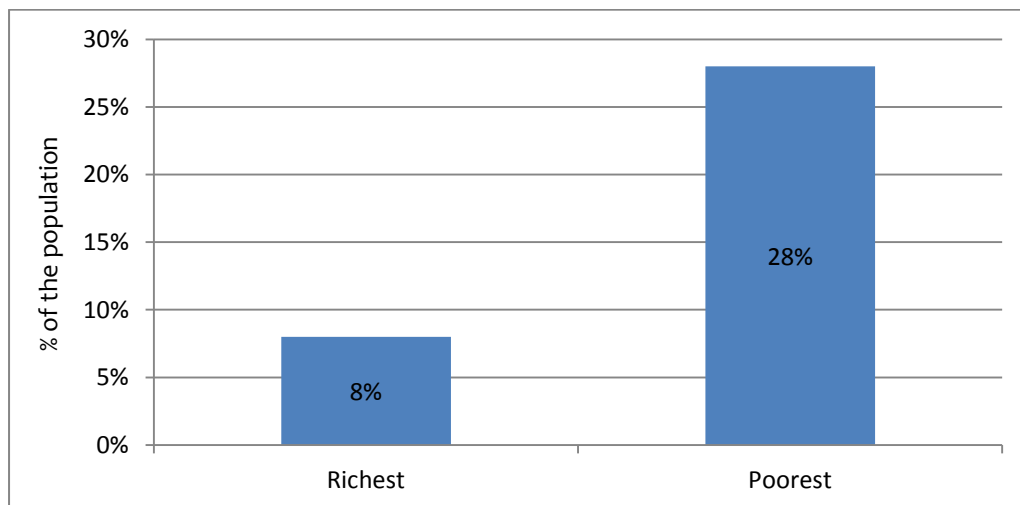
prevalence of stunting at individual level. Other than just investigating inequalities in stunting between two socio-economic groups, this section looks at correlation between stunting and various individual characteristics. This is important for effective results for programmes targeting at reducing stunting and other issues of child nutrition. All analyses have been conducted in STATA™ 12.

i. Health Inequality

Figure 2 presents the distribution of stunting between the two socio-economic groups. Clearly, stunting was more prevalent in the poorest socio-economic group (28%) compared to the richest group (8%). This means that the poorest households have greater risk of having stunted children. This is consistent with the assertions of many studies (Abuya, Ciera & Kimani-Murage 2012, Uthman 2009, Reinbold 2011, May, Julian, TimÃ us, Ian M, 2014)

Table 3 further show details of the five groups of socio-economic status and the Disparity Rate Ratio (DRR). It can be observed that as households get richer, the prevalence or risk of having stunted children reduces. The value of the DRR between the richest and poorest group is 3.5. This indicates that those in the poorest group had more than thrice the stunting rate of the richest group.

Figure 2: Proportion of Stunting, Richest and Poorest Wealth Groups, 2013/14



Source: owner’s construction from ZDHS 2013/14

Table 2: Proportion of Stunting by Wealth Group at 95% Confidence Intervals, 2013/14

Wealth Group	No. of Households	Households with Stunted Children	Relative % Stunting	Standard Errors	95% CI	DRR
Poorest	2958	1388	28%	0.007	27% - 30%	3.5*
Poorer	2955	1251	25%	0.006	24% - 27%	
Middle	2871	1111	23%	0.006	21% - 24%	
Richer	2125	765	15%	0.005	14% - 16%	
Richest	1602	417	8%	0.004	7% - 8%	
Total	12511	4648				

*the DRR is obtained by dividing the proportion of the poorest group by that of the richest.

Table 4 shows some of the factors that may explain the rich-poor disparities in the rates of stunting according to the 2013/14 ZDHS report. As alluded to in earlier sections, prevalence of stunting is related to the ability to access nutritional requirements. It can be observed that the richest group had more access to nutritional requirements than the poorest group. For example, only 15% of the youngest breastfeeding children aged 6-23 months in the poorest socio-economic group was fed the '4 + food groups' compared to 34% in the richest group.

Additionally, 18% of non-breastfeeding children aged 6-23 months in the richest group was fed on milk or milk products compared to a mere 4% among the poorest group. Micronutrient intake among children also varied widely between the richest and poorest groups, with 70% of the children in the richest group consuming foods rich in iron in the last 24 hours before the survey compared to 36% among the poorest group. Minimum meal frequency for breastfeeding and non-breastfeeding children also varied between the two socio-economic groups. The richest group accounted for 59% and 39% of breastfeeding and non-breastfeeding children respectively who met the minimum meal frequency requirement compared to the poorest group who accounted for 38% and 9% respectively.

Table 3: Some of the Rich-Poor Differences in Nutritional Indicators, 2014/14 ZDHS

Category	Nutrition indicator	Richest	Poorest
Selected Feeding Practices- breastfed children (6-23 months)	4+ food groups ²	34%	15%
	Minimum meal frequency ³	59%	38%
Selected Feeding Practices-non breastfed children (6-23 months)	Milk or milk products ⁴	18%	4%
	Minimum meal frequency ⁵	39%	9%
Micronutrient intake among children (6-23 months)	% who consumed foods rich in iron in last 24 hrs.	70%	36%
Micronutrient intake among children (6-59 months)	% given iron supplements in last 7 days	10%	5%
Presence of Iodized salt in the house	% with salt tested	92%	74%
	% with no salt in the household	9%	26%

Source: Zambia Demographic Health Survey, 2013/14

Furthermore, 10% of the children aged 6-59 months in the richest group were given iron supplements in the last 7 days before the survey compared to 5% in the poorest group. Other indicators that favored the richest group are the percentage of households with salt tested for iodine and the percentage of households without salt in the house.

ii. Factors determining stunting

Table 5 presents the Pearson's Chi-square 'goodness of fit' test. All results are highly significant indicating that the prevalence of stunting is related to each of the variables independently. Table 5 also shows the shares of stunting for each household characteristic.

² Food groups: a. infant formula, milk other than breast milk, cheese or yogurt or other milk products; b. foods made from grains, roots, and tubers, including porridge and fortified baby food from grains; c. vitamin A-rich fruits and vegetables (and red palm oil); d. other fruits and vegetables; e. eggs; f. meat, poultry, fish, and shellfish (and organ meats); g. legumes and nuts.

³ For breastfed children, minimum meal frequency is receiving solid or semisolid food at least twice a day for infants age 6-8 months and at least three times a day for children age 9-23 months.

⁴ Includes two or more feedings of commercial infant formula, fresh, tinned, and powdered animal milk, and yogurt

⁵ For non-breastfed children age 6-23 months, minimum meal frequency is receiving solid or semisolid food or milk feeds at least four times a day.

Table 4: Levels of Stunting by Mother's Characteristics

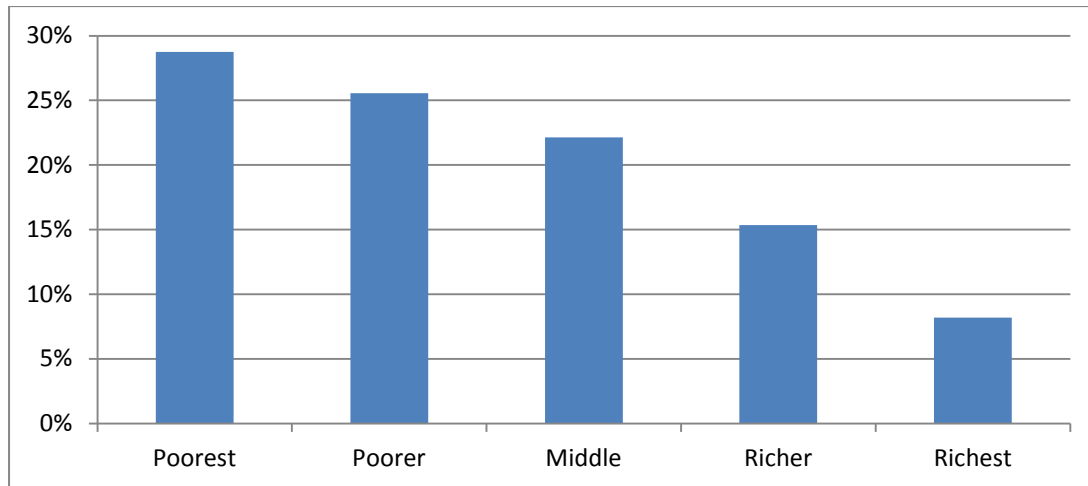
Household characteristics	No. stunted children (n~4648)	% children stunted	Pearson's Chi-square
Education			
No education	556	12%	Chi2(3) = 141.083
Primary	2,783	60%	
Secondary	1,232	27%	
Higher	67	1%	
Wealth			
Poorest	1,336	28%	Chi2(4) = 197.561
Poorer	1,188	26%	
Middle	1,029	22%	
Richer	714	15%	
Richest	381	8%	
Marital status			
Never married	360	8%	Chi2(1) = 7.066
Married	4,270	92%	
Location			
Urban	1,512	33%	Chi2(1) = 47.969
Rural	3,136	67%	
Age			
<25	1,491	32%	Chi2(4) = 13.234
25-34	2,140	46%	
35-44	933	20%	
45-54	84	2%	

Numbers in parenthesis represents degrees of freedom. All results are significant at the 1% level of significance

Overall, approximately 4, 648 out of 12, 511 children eligible for height-for age measurement were stunted. This represents approximately 40% of the total population of children in 2014. Demarcating stunting levels by mother's education attainment, stunting was highest (60%) among mothers with primary education compared to any other level of education attainment. The least prevalence of stunting was among those with higher education which stood at 1%. Those with no education at all had a lower prevalence of stunting than those with primary education but this changes as you move from primary education to secondary and higher..

As expected and indicated in literature (May, Julian, TimÃ us,lan M, 2014, Uthman 2009), the poorest quintile had the highest levels of stunting (28%) compared to the richest quintile (8%). Stunting thus followed the wealth gradient as shown in figure 3.

Figure 3: Stunting by Socio-economic Status



Source: Author’s construction using ZDHS 2014 data

Stunting was also higher (92%) among married women than unmarried ones (8%). Mothers living in the rural areas had more cases of stunting (67%) than those living in urban areas (33%). This is consistency with earlier assertions in literature that living in the rural area is associated with higher likelihood of ill health than living in the urban area.

Age group 25-34 had the highest levels of stunting (46%) compared to any other age group. But the prevalence of stunting drops as you move to higher age groups. This indicates that stunting reduces the older a mother is.

Table 5 presents the results of the probit model. The overall model is significant and so is all the variables used. According to the model, as the education of a mother increases, she is less likely to have stunted children. This finding is consistent with the hypothesis being tested which stated that educated mothers are less likely to have stunted children. The model also predicts that an unmarried mother is more likely to have stunted children. Again

this is consistent with the hypothesis being tested. The results are significant at the 5% level of significance.

Table 5: Probit Regression Results

Variable	Odds ratio*
Education	-0.012** (0.004)
Marital status (ref=unmarried)	0.022*** (0.012)
BMI	-0.0001* (0.0000)
Location (ref=urban)	-0.072** (0.032)
Age	-0.004* (0.002)
Socio-economic status	-1.590* (2.12)
Number of Observations=11 467 Prob > Chi2=0.000	
Log likelihood=-7568.854 Pseudo R2=0.0162	

*p<0.01, **p<0.05, ***p<0.1, Robust standard errors in parenthesis

Increase in BMI is less likely to be associated with cases of child stunting. Meaning as the nutritional status of a mother improve, she is less likely to have stunted children. Mothers who live in the urban areas are less likely to have stunted children. These results are significant at the 5% level of significant. The risks of child stunting are higher in rural areas compared to urban areas.

Similarly as age of a mother increases, she is less likely to have stunted children. This is in line with the descriptive statistics which showed a drop in the prevalence of child stunting especially beyond age group 25-34. Socio-economic status is also associated with less cases

of stunting. This means that prevalence of stunting follows the wealth gradient: the wealthier group is the less likely to have cases of stunting.

viii. Discussion

This study has undertaken two important analyses: one is focusing on health inequality and the other on factors associated with stunting using the 2013/14 ZDHS. Stunting was used as the variable to investigate health inequality using the disparity rate ratio.

Comparing the lowest and highest socio-economic groups clearly show that poorest population groups in Zambia face greater risks of stunting compared to the richest. The DRR, which was the official measure of inequality in this study, had a value of 3.5. This means that for every case of stunting that richest groups suffer, the poorest groups suffer more than thrice as much. While the study did not include other health variables, this finding is indicative of the existence of health disparities evident in literature that the poor suffer more health risks and tend to experience more ill health than their richer counterparts (Wagstaff 2000, Fukuda-Parr 2010). Table 3 and figure 3 further showed the changes in the rates of stunting as socio-economic status increases. This fortifies the reasoning that the poor suffer more ill health than the rich.

Many reasons explain the difference in health and health outcomes of rich and poor observed in this study. Table 4 shows the levels of access to different requirements that impact on nutritional outcomes of children by the poorest and richest groups in Zambia in 2014. It is evident that even in terms of access to such important pre-requisites the poor are disadvantaged as revealed in table 4. More children from the richest groups had access to all the nutritional inputs in table 3 such as access to '4+ food groups', affording the minimum meal frequency and milk or milk products compared to children of the poorest groups. The lack of access to these nutritional inputs reflects different constraints at the household level including purchasing power. Accessing many of these may have financial implications for many mothers. Generally, the poor lack the financial means with which to purchase most of these nutritional requirements, meaning if a mother does not have the means to purchase them, the children would not be fed properly and that raises the risk of stunting.

But money or purchasing power may not be the only thing limiting access to nutritional inputs by many mothers. Foods may be readily available but if mothers or custodians of children do not have the knowledge of how to use them, it becomes problematic. This may also result from lack of basic education which is required to understand some of these issues. Additionally, the poorest also tend to lack access to education which compounds the problems of lack of appropriate information on how to implement nutritional requirements further increasing the risk of stunting for their children. Lacking education also means that they are not able to benefit from some of the returns to education such as income through employment which may enable them to acquire nutrition requirements for their child.

The inequalities demonstrated above while derived using a very simple formula have important implications for improving nutritional indicators and achieving respective MDG targets. Indeed intra-country inequalities must be put into consideration if meaningful progress is to be achieved. The poor remain behind in the achievement of many developmental agendas such as the MDGs, globally and at the country level. Going forward, especially in the effort to achieve the SDGs, consideration must be paid to how to achieve development along with the poorest groups within countries. Bridging the gap between the rich and poor therefore could bring the poor on board and share in the success stories. As at now the poor remain with the largest burden of stunting in the midst of celebrated progress in improvements of some MDG targets. With current poverty rates still high at 60%, the poor will remain an important factor in making progress on many development indicators.

The probit model also reveals interesting findings: clearly the education of the mother is significantly associated with stunting. This has been found in a similar (Reinbold 2011, Darnton-Hill I 1998, Assan, Joseph, Assan, Samuel, Assan, Nicola, Smith, Lauren, 2009). The more educated a mother is the more likely they are to understand and interpret information regarding children's nutrition. But education does not only make mothers able to access and use information, it also puts them in a better position of being involved in gainful employment or economic activities that may generate income needed to purchase some of the foods listed in table 4 earlier.

Surprisingly, when education attainment was broken down into ‘no education’, primary, secondary and higher (table 4), those with primary education had more cases of stunting than those with no education. This is not expected. However, the trend changes when you compare primary, secondary and higher levels of education. As expected there are fewer cases of stunting in households where the mother had secondary education compared to those with primary education. Even more, those with higher education had fewer cases of stunting compared to those with secondary education. This is expected for the reasons already explained above. Policies that promote education potentially help in avoiding cases such as stunting, albeit in the long term. In the short term information dissemination should be fashioned in a way that allows even those who are illiterate to get the messages about good nutritional practices for mothers.

Related to above, since education empowers women to benefit from returns to education that may come in many forms including gainful employment, a deliberate effort should be made to empower women. This can come in many forms: in the long term there should be a strengthening of opportunities for secondary education for girls and promoting universal primary education. Zambia seems to be doing quite well as far as primary school enrolment is concerned (United Nations Development Programme 2013). Transition rates as well as school completion rates have significantly improved for both female and male pupils. This presents opportunities for improved stunting outcomes in future. In the short term policy should focus on women empowerment through developing of women-focused access to finance programmes that allow women to participate in the economy.

The marital status of a mother strongly influences the occurrence of child stunting. Particularly, unmarried mothers were more likely to have cases of stunting. There could be many reasons why this is the case. A married mother is more likely to receive support from a spouse than an unmarried mother. This support can be in different forms including financial. Financial support is particularly important to enable the mother acquire nutritional requirements such as those discussed earlier. But it is not only financial support that spouses provide to their partners. Moral support on how to raise healthy children is equally important. Unmarried mothers lack this too.

The model further predicts that households living in urban areas are less likely to experience stunting compared to those in the rural areas. This is consistent with the earlier descriptive statistics. Rural areas usually lack in many ways including in nutritional requirements needed for the healthy growth of a baby. Information dissemination is also problematic in most rural areas in Zambia as many people lack access to modern methods of information dissemination such as the internet or mobile phones. Therefore such knowledge about things as infant feeding practices may be hard to come by compared to urban areas. The availability of foods such as milk and milk products are also difficult to come across in rural areas especially in certain parts of the country further increasing the risk of stunting for children. In cases where food is available, affordability is usually another issue to deal with as many rural areas in Zambia are worst hit with high unemployment, poverty and low incomes.

The socio-economic group to which a household belongs strongly influences the likelihood of stunting. This relationship has already been explored when analysing health inequality in the earlier part of the results section. As households get richer, they are less likely to experiencing cases of stunting. This is consistent with the hypothesis being tested.

Chapter Three

i. Introduction

Skills development is a key factor in improving the productivity of a workforce (World Bank 2004). A skilled workforce would generally be more competitive and productive and thus able to engage in gainful employment. Empowering the workforce with skills is thus another way of increasing the chances of them being involved in decent and gainful employment which contribute to social inclusion, and poverty reduction. Large informal economies currently characterise most of Africa, skills can open doors for more rewarding opportunities.

Investing in knowledge and skills is therefore important for growing an employable and competitive labor force (World Bank 2004). In recent years, the Zambian government has put skills development as an important pre-requisite for employment creation. After experiencing a period of consistent economic growth for over a decade but without job creation, the focus of policy in Zambia seems to be slowly changing towards building skills relevant to the needs of the economy.

Based on the foregoing, a strategy paper on jobs and industrialisation was published in 2012 which acknowledged expanding access to skills training as one way of supporting industrialisation and job creation by addressing inadequate supply of relevant skills in certain sectors identified priority (Ministry of Finance 2012). Government's official national plan, the Revised Sixth National Development Plan (R-SNDP), highlights the need for skills development to be key in achieving sustained economic growth as well as employment creation. This is also seen as a way to reduce poverty (Ministry of Finance 2013).

Increasing the supply of skilled labor in the economy depends on a number of factors. Specifically, growth in skilled labor is directly linked to growth in enrolments in skills training institutions. This is what seems to be one of the most important problems in Zambia. Skills training institutions are limited while those available have special constraints and cannot

accommodate as many learners as would increase the supply of skilled labor in the economy. As a result skills continue to be in short supply in many sectors. This is the basis and focus of this study. By exploring the nature of skills training institutions and the various avenues for skills training in Zambia, the study hopes to provide new insights that could aid policy to unlock the potential of a skilled work force through improving skills training. By investigating the factors that affect participation in skills training, the study also hopes to highlight barriers to skills training and how they can be overcome to promote more learners, in turn growing the pool of skilled labor in the country.

ii. Overview of Skills Development in Zambia

The United Nations Educational, Scientific and Cultural Organization (UNESCO) define skills in a broad sense to comprise three related elements: These are foundation skills, transferable skills and vocational and technical skills (UNESCO 2012):

- Foundation Skills, also referred to as cognitive skills, cover basic literacy and numeracy. These skills are usually acquired in primary and secondary education and can be said to be prerequisite for acquiring any further skills in one's life-long learning. These skills are often referred to as academic or subject-based skills and thinking skills.
- Transferable Skills or non-cognitive skills cover soft or interpersonal skills such as problem-solving, communication and teamwork. They also cover capacities in the attitudinal or non-cognitive domains such as motivation, self-confidence, aspiration and even entrepreneurial capabilities. Transferable skills are to a large extent acquired at home, in the family and from wider social networks or from on-the-job training.
- Technical and Vocation Skills refer to the knowledge, practical competencies, knowhow and attitudes necessary to perform a certain trade or occupation in the labour market. Such competencies can be acquired through formal public or private technical and vocational education, or through formal work-based training and informal apprenticeship. This aspect of Skills is the main pre-occupation of this paper

and will be generally referred to as Skills. It is also important to note that Skills in this paper is the equivalent of Technical Vocation and Education Training (TVET) or Technical and Vocational Skills Development (TVSD) used by other authors in different reports and studies (Kirchberger 2004, Osinachi, Nebechi 2012, UNESCO 2012).

The Technical Education and Vocational Training Authority (TEVETA) is the institution responsible for coordinating the provision of skills training in Zambia. Training is offered through different avenues, namely formal institutions of learning (public and private), work place based programmes or on-the-job training and apprenticeship.

Formal institutions of learning are more common than work based skills training though the latter has also been in existence for many years. Apprenticeship, mainly common in rural areas and informal settings is the most informal way of skills training. While many people obtain important skills by this approach, they are not formally certified and hence not widely recognised by employers. According to TEVETA, in 2013 there were a total of 275 institutions formally registered to provide skills training (TEVETA 2013). The majority of these were private institutions (68%), while the rest were Government owned. Within the private sector were institutions run and owned by the Church, Communities, Trusts, Companies and NGOs.

In terms of geographical distribution of skills training institutions, 65% of them are located in Lusaka and the Copperbelt, which are the most urbanised regions of the country. The rest are distributed in the remaining eight provinces with the more rural areas having the least number of institutions.

Foundational skills, such as those acquired in primary and secondary school are important prerequisites for enrolment in skills training at many levels in Zambia. For formal institutions of learning, candidates are expected to have completed primary or secondary school for

them to qualify. This means that the availability and quality of basic and secondary education plays an important role in determining the quantity and quality of students in skills training institutions. Lack of access to primary and secondary education therefore has a bearing on the number of students who can access skills training. Similarly, low quality primary and secondary education mean low quality students in Skills training institutions.

iii. Problem Statement

Zambia has experienced unprecedented economic growth for the past decade, averaging more than 7 % of GDP (Ministry of Finance 2013). Nonetheless growth has not translated into job creation and poverty reduction. Formal jobs especially remain stagnant. Between 2005 and 2012, the labour force grew by about 1,050,000 but formal employment only increased by 334,100 (Central Statistical Office 2012b). Similarly, only 14 % of the labour force could be absorbed into the labour market in 2012 (Central Statistical Office 2012b).

Youth unemployment is and will continue to be of particular concern as Zambia's population remains relatively young, with 52.5 % of the population younger than 18 years (Central Statistical Office 2012a). The number of young people entering the labour market has also been on the increase despite the lack of a corresponding growth in job opportunities. Between 2008 and 2012, the number of young people entering the labour force was estimated at 210,334 annually, against a mere 194,818 overall formal jobs per annum being available over the same period (Central Statistical Office 2012b). This is an indication that youth participation in formal sector employment is limited. The current demographics also mean that the country will continue to face high demand for jobs from young people, and this has important implications for poverty reduction and fulfilment of Zambia's development goals.

Against this background there is urgent need to address the high levels of unemployment as one way of fighting poverty and reducing the levels of marginalization not only among the youth but other affected groups. Providing jobs is also one of the most practical ways of

translating strong economic growth into meaningful human development. Non-provision of jobs on the other hand may threaten the social and economic standing of Zambia and the peace which the country enjoys. Unemployment, especially for the youth can lead to destitution and anomie, which might increase delinquent and anti-social behaviours.

The high unemployment, especially among the youth, can to a large extent be attributed to the lack of sufficient and appropriate skills by the Zambian labour force. It is possible that a good number of those unemployed are without work not only because of a complete lack of job opportunities in the economy but also due to their lack of appropriate skills. Evidence shows that even in sectors where job opportunities are found, demand for labour will continue to outstrip supply due to lack of appropriate skills (African Development Bank 2013). Further evidence shows that in some instances the skills demanded by employers do not match the skills possessed by job seekers (Moono, Rankin 2013).

In light of the above, a solution needs to be found if unemployment is to be reduced. One of the optimal ways of doing this may be by simply providing more skills through enrolment of more youths in skills training. Increased participation in skills training is therefore necessary even before the issue of the appropriateness of the skills is addressed. This is the concern of this paper. The aim is to investigate the rates of participation in skills training in Zambia and understand the factors affecting participation. The assumption is that if more people participated in skills training, skills shortages would be minimised and more people would have increased chances of finding employment. This will in turn reduce unemployment especially among the youth provided that the economy creates job opportunities.

iv. Rationale of the Study

The importance of this study is that it seeks to investigate the factors determining participation in skills training as a starting point for increasing skills supply. As skills development has been a policy priority for government in recent years (Ministry of Finance 2012, Ministry of Finance 2013), this study will contribute to current policy debates and help

shape the next level of skills development. Additionally, as the country moves towards expanding skills development, it is necessary to understand the determinants of participation and lack of participation in skills training as a basis for improving access.

The study is also important as it highlights the various avenues of skills training in Zambia which currently include public and private institutions, on-the-job training and informal apprenticeship. At present there exists no study in Zambia which has investigated the characteristics of learners who chose to receive training from any of the said sources. Through this analysis, the study will be able to provide an understanding of the dynamics of skills training institutions in Zambia. This information can also aid TEVETA in its processes of registering training institutions.

In sum, then, the purpose of this research is to investigate the factors which facilitate/impede the supply of individuals into the skills training and development institutional landscape, as a means towards improving greater access and participation. In turn, it is anticipated that this increased enrolment in training and skills development will have the positive outcome of providing a greater crop of skilled workers for the economy, thereby contributing to better economic growth for the country and improved poverty reduction and quality of life outcomes for the individuals involved.

Youth in this study refer to young people who qualified to belong to the labour force aged 15-24. While the lower limit for the international definition of youth may be lower than age 15, anyone falling below does not qualify to belong to the Labour Force according to Zambian laws.

v. Literature Review

i. Skills Training Avenues

The avenues for the delivery of skills training in Africa differ from country to country, albeit the common channels are technical and vocational institutions (public and private), enterprises or work places, and apprenticeship training centres. In West Africa, traditional apprenticeship offers the largest opportunity for the acquisition of employable skills in the informal sector while in Sub-Saharan Africa school-based programmes are more common (Kirchberger 2004). Kirchberger adds that skills training in Africa is generally delivered by both government and private providers, which include for-profit institutions and non-profit, NGO and Church-based institutions.

a. Public Institutions

Public or state-sponsored training institutions are an important source of skills training. Johanson and Adams observe that ‘public institutions tend to respond to the demand for more costly skills, particularly at the tertiary level, and provide better geographical coverage while suffering from poor quality and a lack of connection with market needs’ (Johanson, Adams 2004). They add that public training institutions also suffer limited investments in both technology and human resource which has important implications on quality of skills training they offer.

b. Private Institutions

Private institutions include not-for-profit nongovernmental organizations (NGOs), religious-based providers, and for-profit trainers. The scope of not-for-profit private institutions tends to include social objectives to reach the disadvantaged populations with skills development. Johanson and Adams highlight that NGOs and religious institutions while trying to reach the disadvantaged tend to be less well connected with markets and employers (Johanson, Adams 2004). They further note that women constitute the majority of students in private institutions in Ghana (76%) in Tanzania and Zimbabwe (60%) and Senegal (55%). As one would expect, for-profit private providers are often concentrated in the urban centres, while Church based institutions or not-for-profit NGOs tend to be based in rural and economically disadvantaged locations (TEVETA 2013).

c. Apprenticeship/On-the Job Training

Hans (2010) identifies three types of apprenticeships or on the job skills training. These are traditional, informal and modern apprenticeships:

- Traditional apprenticeship training is said to be one which is a well-organized transfer of skills within family/social group based on socio-cultural conventions. Training results from an agreement between a mastercraft man or woman and parents/guardian and apprentice. Often, no payment of training fee is required. The mastercraft usually takes care of lodging and food of apprentice.
- Informal apprenticeships on the other hand are said to be more open; that is the majority of apprentices come from outside the family. Informal apprenticeships also tends to offer more regular training courses, fixed time schedules, shorter training periods and payment of (regular) training fees.
- Modern apprenticeship training, which is the common on-the-job training tends to be more defined and organised than the earlier two. Here, the length of training period, training format, number of working/training hours, payment of (part of) minimum wage are all stipulated.

ii. Factors Determining Participation in Skills Training and Choice of Training Avenues.

Literature on the characteristics influencing participation in skills training abound. While most of the studies have taken place in different settings, the characteristics seem to be closely related globally. However, very few of these studies have focused on Zambia particularly. Even then, the similarities shared between Zambia and a number of African countries where studies have been done make observations and conclusions from those countries quite relevant and applicable to Zambia. Generally, literature seems to suggest a long list of factors influencing participation in skills training. These include educational background, socio-economic status, economic sector in which one is found, age, and gender, location and disability of an individual.

Educational Background

Most students who enrol in skills training are considered to be those who have failed in general education (Afeti, Adubra 2015, International Labour Office 2012). Kirchberger adds that in Sub-Saharan Africa, 'students enter the vocational education track at the end of primary school, corresponding to 6 – 8 years of education in countries like Burkina Faso and Kenya, or at the end of lower or junior secondary school, which corresponds to 9 – 12 years of what is called basic education in countries like Ghana, Nigeria, Mali and Swaziland' (Kirchberger 2004). This means that Skills training entrants need not have advanced education requirements to qualify for training. That is to say, even primary or basic education is deemed sufficient to secure entry into training.

The vocational education track has also been described as a career path for the less academically endowed (International Labour Office 2012, King, Palmer 2013, Catherine, Jacob 2014). This perception has been supported by the low academic requirements for admission into technical and vocational skills programmes such as noted above. Thus, one other characteristic of skills training students is that they are unable to continue to higher education. Afet and Adubra (2015) also note that in many African countries, the technical and vocational education track is still considered as a last resort or second choice to general education by both parents and learners. Thus, skills training has a reputation of being perceived as a “dead end” in terms of academic progression.

By contrast, the Asian Development Bank notes that skills training tends to be an important source of education and training that is important to the poorer in society, who are in many cases unlikely to be able to access higher academic education (Asian Development Bank 2009). This means that students who settle for skills training may not necessary be less academically endowed but choose this track because they lack access to high status education which in most cases is too expensive and unaffordable for them. Indeed, in Africa for example, many young people drop out of school not for lack of academic prowess but as a result of a number of factors related to poverty and financial deprivation.

In terms of choosing a training avenue, students with low education backgrounds are more likely to choose a training avenue that does not emphasize high levels of prior formal

education (Johanson, Adams 2004). The International Labour Organisation also observe that in Africa most public institutions tend to require significant prior education including literacy, numeracy and high school education, thus marginalising a large section of the poor from entry (International Labour Office 2012). Therefore students with low levels of education are likely to choose apprenticeship or a private sector NGO that puts less emphasis on prior education.

Age

Several studies show that youths are the majority of participants in skills training (UNESCO 2012, Biavaschi et al. 2012, Langevang, Gough 2012). The reasons are many. Firstly populations in most African countries are young, which means skills training and other tertiary education will constantly be in demand in this age cohort. Secondly, especially in developing countries, youth are among the most vulnerable groups in the work place and among the worst affected groups when it comes to unemployment (IFAD 2011). This makes youths among the most vulnerable and marginalised groups both socially and economically, and thus most likely to be addressed by such programmes. According to the International Labour Organisation, regional youth unemployment rate in Sub-Saharan Africa is significantly higher than the adult unemployment rate which stood at 5.9 and 11.8 % in 2012 respectively (ILO 2013). Efforts to reduce unemployment have therefore included the need to increase youth participation in skills training to improve youth employability.

Gender

Gender has become an important consideration when discussing participation in skills training. Males and females do not have equal access to participation in skills training, and indeed general education (Hartl 2009). Women are usually underrepresented in vocational and technical educational programs in most of Africa (International Labour Office 2012). Indeed there are widespread problems of gender equity in skills training in Southern Africa as no country has reached gender parity in enrolments in the region (SADC 2011): women accounted for fewer than 15 % of skills training enrolment in Eritrea, Ethiopia, Malawi, Namibia, Niger and Uganda. Girls also accounted for 38% in Botswana and Mauritania, 40% in Chad and Senegal and 30% in Mozambique (AfDB/OECD 2008). The highest proportions of female enrolment were in Benin, Egypt and Kenya and even these were still less than 50%. In

Nigeria females accounted for only 19 % of total enrolment rate during the academic year 2001-2002 (African Development Fund 2005).

There are many explanations for marginalisation of females in skills training. Firstly, the low proportion of girls in technical and vocational education reflects the low participation of girls in both primary and secondary education (International Labour Office 2012), and the consequent lower literacy levels among women than men. UNESCO estimates that adult illiteracy is a problem that affects more women than men, adding that by 2013, 61% of illiterate youths were female, accounting for the majority of the youth illiterate population in the Arab States (65%), Central and Eastern Europe (59%), South and West Asia (64%), and sub-Saharan Africa (60%) (UNESCO 2013). This means that a further systematic barrier to skills training for women are the training materials which are often not designed to accommodate those with lower levels of basic education and those who lack literacy and numeracy (UNESCO 2009).

Secondly, the location and timing of training may not suit the needs of women in most cases. Globally, women tend to have a lot of household related responsibilities including childcare. If these responsibilities conflict with the timing of Skills training, women are less likely to attend (Collett, Gale 2009). Early marriages further limit the possibilities of women participating in skills training as they are usually found trapped in domestic responsibilities as a result (Hartl 2009). Similarly, most training venues lack women's facilities such as toilets which further push women away from participating (Suriyasarn, Resurreccion 2003).

Informality

Those participating in skills training are also associated with the informal sector. Due to the relatively large informal sectors in most of African economies, youths in particular are not able to find space to work in the formal sector and are usually confined to the informal sector (International Labour Office 2012, Catherine, Jacob 2014). However, the informal sector is associated with low levels of education (King, Palmer 2013).

Those working in the informal sector are also likely to choose the private not-for-profit training avenue. This is mainly because private not-for-profit providers tend to be less bureaucratic and more flexible than public providers (International Labour Office 2012). They also tend to have a stronger business orientation and greater links to the private sector, with shorter demand-driven courses. The ILO adds that those in the informal economy are not likely to choose private sector providers as their fees make them inaccessible to the informal economy (International Labour Office 2012).

Socio-economic status

Low income households is identified as one of the characteristics of those who participate in skills training (Asian Development Bank 2009). Skills training systems also tend to be well suited for the poorer in society, who are unlikely to be able to access high status academic education (SADC 2011). In most cases this is because low income individuals and households lack the means to pay for high status education. Nonetheless, skills training is not free and students still have to pay high fees and meet transport costs regardless of where they are coming from (International Labour Office 2012). Therefore, it is possible that selection processes unintentionally channel lower income students into second-or last-choice streams such as skills training.

In Vietnam, most poor families cannot afford to send children to vocational or technical training without scholarship (Hartl 2009). Only those receiving funding support from Government were able to do so. This indicates that the poor face financial difficulties when it comes to skills training. Similarly, in Kenya fees are a significant barrier to skills training for many (Glennerster et al. 2011). Glennerster et al further observe that even at the cheapest government schools, fees account for approximately 15 % of annual per capita expenditures which is unaffordable for poor families.

But financial costs are not the only challenge that poor households and individuals face. Usually low income households and individuals also face high opportunity costs of training as they have to choose between remaining in training or opting out in order to subsist (Asian Development Bank 2009).

In terms of choosing a skills training avenue, poorer individuals and households tend to choose public schools over the private sector because of the lower fees (International Labour Office 2012). Poor students are also likely to attend Church-based institutions which tend to serve economically disadvantaged populations (Kirchberger 2004).

Location

The literature also shows that spatial location (urban or rural) is an important differentiator of those who participate in skills training (IFAD 2011, Hartl 2009). Urban residents in general have better access to services and skills training. The geographical distribution of training institutions is thus a factor of inequity and unequal access to skills training (Afeti, Adubra 2015). Afeti adds that in 'many countries, the majority of the better endowed formal skills training institutions are located in the urban centres, making it difficult for rural dwellers to get access to quality and diversified skills training opportunities as their compatriots in the cities'.

Location also plays an important factor in choosing the skills training avenue. Learners in the rural areas are more likely to choose apprenticeship as their source of training (Bas 1989). This is mainly for availability and affordability reasons especially in most of Africa where apprenticeship is common in rural areas. Rural students are also more inclined towards Church based training which tends to be based in rural and economically disadvantaged locations (SADC 2011). In contrast, urban students are likely to choose private providers and especially for-profit which are often concentrated in the urban centres (Johanson, Adams 2004).

Disability

Disability is an important characteristic of skills training and a well-known determinant of participation. This section draws extensively on the report by the International Labour Organisation (International Labour Office 2007) on Strategies for Skills Acquisition and Work for Persons with Disabilities in Southern Africa with a focus on Zambia. The report makes the following highlights:

- People with disabilities: physical disability, hearing impairment, visual impairment and intellectual disability face special barriers to skills training. Some of these include distance to training centres, lack of special facilities, lack of appropriate training materials and lack of acceptability by trainers.
- A comparative analysis of Malawi, Zambia and South Africa on the plight of the disabled in skills training found that the disabled face serious challenges accessing training centres: About 18% and 16% of respondents in Malawi and Zambia respectively said access to training centres was a barrier to skills training. In South Africa 27% of respondents faced similar challenges.
- Other challenges faced by those with disabilities and prevented them from attending skills training were visual or hearing impairments as some centres lacked special training materials such as in Braille for the visual impaired. Lack of assistance in the form of special needs teachers was another factor hindering participation. The lack of sign language interpreters; lack of suitably-trained teachers and unsuitable courses were additional barriers to participation.

vi. General Research Topic

In view of the fore-going, the main objective of this study is to assess the factors that determine participation in skills training and the choice of a training avenue. The study will investigate the individual characteristics of those who manage to participate in skills

training, the avenues through which they receive training and the possible reasons behind these choices.

a. Specific Research Foci:

- To assess the determinants of participation in skills training.
- To assess the determinants of choosing a given skills training avenue

b. Hypotheses

A number of studies have highlighted some of the factors that determine participation in skills training and the choice of the avenue through which to acquire skills. Though few of them are based on Zambia, they still give sufficient evidence to this effect. Based on these studies this paper will test the following hypotheses:

- i. Being male, young and living in an urban area increases the chances of participating in skills training.
- ii. Those living in urban areas and working in the formal economy are more likely to choose private institutions and on-the-job training respectively as avenues for acquiring skills compared to public facilities.
- iii. Those living in rural areas and working in the informal sector will rely on apprenticeship as the main avenue for acquiring skills compared to public institutions.

vii. Methodology

The study is grounded in quantitative data and analyses supplemented by qualitative information through a desk review of various documents by both government and development stakeholders.

a. Data

The analysis in this paper is based on the 2012 round of the Labour Force Survey (LFS) which is a nation-wide survey covering a nationally representative sample of about 11, 520 households in all the ten provinces of Zambia. The LFS focuses on various labour related issues which include access to vocational skills training and training providers. It is the primary survey addressing employment related issues in Zambia. The LFS is also based on a

robust sampling design with weights that ensure each province in Zambia has an equal chance of being selected. The sampling methodology also takes into account the differing size of sampling clusters to avoid oversampling or under-sampling certain clusters.

b. Analytic Techniques

i. The logistic model

The analysis employs logistic regression (Jones 2006) to assess the determinants of participating in skills training. The logistic model is a binary outcome model specified as follows:

$$y^* = \alpha + \sum_i \beta_i X_i + \varepsilon_i$$

Where the dependent variable (y^*) is binary: It takes the value of 1 if an individual has attended skills training and a value of 0 otherwise. This is a measure of participation in skills training. X_i is a list of independent variables. α is the constant and β_i the coefficients being estimated. ε_i is the error term which is assumed to be normally distributed for the model to be an efficient estimator. Both the binomial and multinomial logistic regression models were run to assess how the model behaves before and after controlling for the effects of different variables. The variables used are summarised in table 1.

Table 6: Variables Used in Logistic and Multinomial Models

Variable Name	Variable definition and description	
Dependent variables	Logistic Regression	Multinomial Logit
<i>Skills</i>	Binary (1=yes, if the individual had participated in skills training, 0=otherwise)	NA
<i>Training avenues</i>	NA	1=On-the-job 2=Public institution 3=Private institution 4=Apprenticeship
Independent Variables		
<i>Sex</i>	Binary (0=female, 1=male)	Binary (0=female, 1=male)
<i>Age</i>	Continuous (age in years)	Continuous (age in years)
<i>Location</i>	Binary (0=urban, 1=rural)	Binary (0=urban, 1=rural)
<i>Economic Sector</i>	Binary (0=informal, 1=formal)	Binary (0=informal, 1=formal)

<i>Education</i>	Continuous (education in single years)	Continuous (education in single years)
<i>Disability</i>	Binary (0=has disability, 1=has no disability)	Binary (0=has disability, 1=has no disability)

ii. The multinomial logit model

The multinomial logit model (Jones 2006) was used to assess the determinants of choice of a skills training avenue. Multinomial models apply to discrete dependent variables that can take (unordered) multinomial outcomes, $y = 1, 2, \dots, m$. Define a set of binary variables to indicate which alternative ($j=1, \dots, m$) is chosen by each individual ($i=1, \dots, n$). The probability of individual i choosing outcome j is then given by:

$$P_{ij} = \exp(x_i \beta_j + z_{ij} \gamma) / \sum_k \exp(x_i \beta_k + z_{ik} \gamma)$$

The coefficients (β_j) on the independent variables that vary across individuals (x_i) are allowed to vary across the choices, j . For example, the impact of gender may be different for different types of skills training avenues. The coefficients (γ) on the variables that vary across the choices and perhaps across individuals (z_{ij}) are constant. All of the γ equal zero in this case since we are interested in the characteristics of the chooser.

Since it is not possible in the multinomial logistic to identify separate β s for all the choices, the β s for one of the choices is set to equal zero. This normalisation reflects the fact that only relative probabilities can be identified with respect to a base-line alternative. Public institution was in this case set to be the reference group against which other possible choices have been compared. The dependent variable and independent variables used in the model are also presented in table 1.

viii. Results

The results are presented in this section. All analyses were done in STATATM 12. Table 2 shows some of the descriptive summaries of the 2012 Labor Force Survey. In total, the sample included 11 520 households which translated into approximately 58 680 individuals. However, only about 31 504 individuals were of the working age population (15 years and

above). These are the ones who responded to the survey questions related to labor including skills training.

Table 7: Descriptive Statistics, 2012 LFS

Sample Characteristics	N*	Mean	Proportion	SD
Approximate number of Households	11 520			
Approximate number of individuals	58 680			
Size of working age population (>=15)	~31 504			
Mean age: working age population (>=15)	~31 504	32		0.087
Mean age: skills training participants	1 984	40		0.32
Mean years of schooling: working age population (>=15)	31 504	7.9		0.018
Mean years of schooling: skills training participants	1 984	9.5		0.071
Participated in Skills Training				
Yes	1 984		6.3	0.001
No	29 520		93.7	0.001
Economic Sector				
<i>Formal</i>	1 944		16	0.003
<i>Informal</i>	10 055		84	0.003
Gender				
<i>Male</i>	15 320		48	0.002
<i>Female</i>	16 384		52	0.002
Location				
<i>Rural</i>	17 605		54	0.002
<i>Urban</i>	14 099		46	0.002
Disability Status				
Yes	373		1	0.000
No	48 320		99	0.000
Skills Training Avenue				
<i>Public</i>	652		33	0.010
<i>Private</i>	530		27	0.009
<i>On-the-job</i>	289		14	0.008
<i>Apprenticeship</i>	514		26	0.009

*The total sample included 11 520 households which amounted to approximately 58 680 individuals. But the working age population (15 years and above), which is of main interest to the labor force was approximately 31, 504. Analyses are based on this population.

The mean age of the working age population was estimated at 32, suggesting that Zambia's labor force is relatively young. This is consistent with the findings of the 2010 Census of Population and Housing conducted two years prior to the labor force survey, which

established that more than 80% of the Zambian population was below the age of 35 (Central Statistical Office 2012a). Despite this low mean age, and surprisingly, the mean age of those who participated in skills training was 40, suggesting that while the labor force was relatively young, skills training was skewed towards older members of the working age population.

In terms of education attainment, the mean years of schooling for the working age population was approximately 8 years, implying that most members of the labor force barely have basic education (grade 9), much less having completed secondary school. However, there was a slight increase amongst those who participated in skills training as their mean years of schooling was 9 years. This is consistent with findings by Kirchberger (2004) who concluded that in Sub-Saharan Africa, 'students enter the vocational education track at the end of primary school, corresponding to 6 – 8 years of education in countries like Burkina Faso and Kenya, or at the end of lower or junior secondary school, which corresponds to 9 – 12 years of what is called basic education in countries like Ghana, Nigeria, Mali and Swaziland'.

Those who participated in skills training accounted for 6.3% of the working age population. This is seemingly very low but there could be various reasons for this and these are explored later on. The informal sector accounted for the majority (84%) of those who participated in skills training compared to the formal sector. Females and those living in the rural areas accounted for the majority of the population accounting for 52% and 54% respectively. Males and those living in urban areas accounted for 48% and 46% respectively. Public institutions accounted for the largest number of skills training participants (33%) followed by private institutions (27%). On-the-job training was the least used avenue for skills training accounting for 14%.

Table 3 shows the results of the logistic regression showing the unadjusted and adjusted odds ratios. Unadjusted odds ratios are the result of the bivariate regression while adjusted

odds ratios are the result of multivariate analyses. The bivariate analyses are useful in understanding how each independent variable separately affects the dependent variable. However, they do not account for the simultaneous effect of the determinants on the dependent variable, hence they do not control for the effects of other explanations. This can only be achieved by the use of the multivariate analyses as shown.

Table 8: Logistic Regression, 2012 LFS

	Unadjusted Odds Ratios (95% CI)	P value	Adjusted Odds Ratios (95% CI)	P value
Formality (ref=formal)	2.20 (1.91, 2.54)	0.00	0.95 (0.81, 1.12)	0.57
Age	5.86 (5.07, 6.76)	0.00	1.02 (1.02, 1.03)	0.00
Education	1.21 (1.19, 1.23)	0.00	1.14 (1.11, 1.17)	0.00
Sex (ref=male)	0.37 (0.33, 0.40)	0.00	0.48 (0.41, 0.56)	0.00
Location (ref=rural)	0.45 (0.41, 0.49)	0.00	0.43 (0.37, 0.50)	0.00
Disability	0.68 (0.36, 1.29)	0.24	1.37 (0.52, 3.59)	0.52

The dependent variable is Skills, which assumed the value of 1 if an individual participated in skills training and 0 if not. Participation in Skills is there the reference category on which all interpretations of results are based.

In the bivariate model an individual working in the informal sector is more than twice as likely to participate in skills training (OR=2.20, p=0.00) as compared to one in the formal sector. This has been found by other authors (International Labour Office 2012). Results for the multivariate model are not statistically significant.

Increasing age by a year significantly raises the likelihood of participating in skills training (OR=5.86, p=0.00) in the bivariate model. However, the odds drop from 5.86 in the bivariate

analysis to 1.02 in the multivariate analysis though it still remains statistically significant ($p=0.00$). This finding is not consistent with most of the literature which indicates that younger people or youths are the majority of participants in skills training in many countries (UNESCO 2012, Biavaschi et al. 2012, Langevang, Gough 2012).

One extra year of schooling increases the odds of participating in skills training by 21% in the bivariate analysis and 14% in the multivariate analysis ($p=0.00$). Again this is contrary to the literature which suggests otherwise. Specifically, many authors say students who enrol in skills training are considered to be those who have failed in general education (Afeti, Adubra 2015, International Labour Office 2012). Others have pointed out the vocational education track has also been described as a career path for the less academically endowed (International Labour Office 2012, King, Palmer 2013, Catherine, Jacob 2014).

Females are less than half as likely to participate in skills training ($OR=0.37$, $p=0.00$) compared to their male counterparts. This remained consistent from the bivariate analysis to the multivariate analysis, as the odds of females participating in skills training were still less than 1 ($AOR=0.48$, $p=0.00$). This is strongly supported in other literature: women are generally underrepresented in vocational and technical educational programs in most of Africa (International Labour Office 2012) and no country has reached gender parity in enrolments in the SADC region (SADC 2011).

The odds of participating in skills training are half for an individual living in the urban area as compared to those living in the rural areas. While this is consistent between the bivariate ($OR=0.45$, $p=0.00$) and multivariate models ($AOR=0.43$, $p=0.03$), it is contrary to the literature which argues for the opposite. Afeti observed that urban residents in general have better access to services and skills training due to a number of factors including the geographical distribution of training institutions which are biased towards urban areas (Afeti, Adubra 2015).

Table 4 presents the results of the multinomial logit model. For reasons already discussed earlier both the bivariate and multivariate models are presented side by side. Both models use the public institution as the reference category against which all other available choices are compared. The reason for choosing public institutions is manifold:

1. By default, in Zambia the public sector is expected to take the lead in skills provision through public owned institutions.
2. Public institutions also tend to have more participants and have a more equal distribution across the country than any other skills training avenue.
3. Public institutions also receive more support and funding from the Government and may be established with relative ease compared to any other.

i. *On-the-job training vs Public Institution (Table 4)*

Both the bivariate and multivariate models show that as age increases an individual is less likely to choose on-the-job training as the avenue of skills training than public institution.

Table 9: Multinomial Logit: On-the-job Training vs Public Institution

	Unadjusted Odds Ratios (95% CI)	P value	Adjusted Odds Ratios (95% CI)	P value
On-the-job				
Formality (ref=informal)	-0.11 (-0.52, 0.29)	0.59	0.17 (-0.28, 0.63)	0.45
Age	-0.01 (-0.01, 0.00)	0.30	-0.02 (-0.03, 0.00)	0.03
Education	-0.2 (-0.25, -0.15)	0.00	-0.26 (-0.34, -0.18)	0.00
Sex (ref=female)	-1.1 (-1.46, -0.73)	0.00	-1.84 (-2.54, -1.13)	0.00
Location (ref=urban)	0.15 (-0.15, 0.44)	0.33	-0.18 (-0.66, 0.29)	0.45
Disability	0.31 (-1.13, 1.74)	0.68	0.97 (-1.66, 3.60)	0.47

However, only the multivariate model is statistically significant (AOR=-0.02, p=0.03), meaning that other factors such as education, sex, location, disability and formality contribute to ones choice of a skills training avenue between on-the-job training and public institution. Similarly, as the years of schooling increases, an individual is less likely to obtain

skills through on-the-job training than through a public institution. Results are almost the same for the bivariate (OR=-0.2, p=0.00) and multivariate (AOR=-0.26 p=0.00) analyses. Female participants were 1% less likely to choose on-the-job training to receive skills training over public institution than male participants when using the bivariate model (OR=-1.1, p=0.00). The odds were even higher (84%) and significant under the multivariate model (AOR=-1.84, p=0.00). Results were not significant in terms of the effect of location and disability for both models.

ii. *Private vs Public Institution (Table 5)*

Older participants were less likely to choose a private skills training institution over a public institution. Both the bivariate and multivariate models were significant (p=0.00) with odds ratios of -0.02 and -0.03 respectively. Increasing the years of schooling reduces the likelihood of choosing a private institution over a public one, but this is only significant under the multivariate model (AOR=-0.08, p=0.02). Johanson has also observed students with low education background are more likely to choose a training avenue that does not emphasize high levels of prior formal education such as private institution over public (Johanson, Adams 2004). The International Labour Organisation also adds that students with low levels of education are likely to choose apprenticeship or a private sector NGO that puts less emphasis on prior education (International Labour Office 2012).

Table 10: Multinomial Logit: Private vs Public Institution

	Unadjusted Odds Ratios (95% CI)	P value	Adjusted Odds Ratios (95% CI)	P value
Private				
Formality (ref=informal)	0.13 (-0.20, 0.46)	0.43	0.12 (-0.25, 0.48)	0.53
Age	-0.02 (-0.03, -0.01)	0.00	-0.03 (-0.04, -0.01)	0.00
Education	-0.02(-0.06, 0.02)	0.36	-0.08 (-0.15, -0.01)	0.02
Sex (ref=female)	0.25 (0.01, 0.49)	0.04	0.26 (-0.10, 0.62)	0.16
Location (ref=urban)	-0.48(-0.74, -0.22)	0.00	-0.16 (-0.56, 0.24)	0.44
Disability	-14.96 (-1728.36, 1698.45)	0.99	-13.19 (-1199.84, 1173.47)	0.98

The odds of choosing a private institution over a public institution is 0.25, $p=0.04$ for females than for males. This means that females are four times less likely to choose a private institution over a public institution compared to males. The results for the multivariate analysis are not significant. Similarly, an individual living in the urban area is less likely to choose a private institution over a public institution than one in the rural area (OR=-0.48, $p=0.00$). Again results are only significant for the bivariate model. Additionally this finding is contrary to some of the literature which argues that urban students are likely to choose private providers and especially for-profit which are often concentrated in the urban centres (Johanson, Adams 2004).

iii. *Apprenticeship vs Public Institution (Table 6)*

A participant working in the informal sector of the economy is 7% less likely to choose apprenticeship over public institution than one in the formal sector, $p=0.05$. However, the odds drop to -0.47, $p=0.04$. Increasing the age of a participant reduces the likelihood of choosing apprenticeship over a public institution, (AOR=-0.05, $p=0.00$). As years of schooling increases, an individual is less likely to choose apprenticeship over public institution (OR=-0.34, AOR=-0.36, $p=0.00$). Females are less likely to choose apprenticeship over public institution compared to their male counterparts (OR=-0.74, AOR=-0.79, $p=0.00$). An individual living in the urban area is 6% more likely to choose apprenticeship over public institution than one living in the rural area (OR=1.06, $p=0.00$). However, under the multivariate model the odds of choosing apprenticeship over a public institution change to 0.43, and remains significant ($p=0.00$), meaning that a person in the urban area is less likely to choose apprenticeship over public institution than one in the rural area. This is intuitive as most public institutions are in urban areas. Additionally most apprenticeship is done in informal settings common in rural areas than urban areas.

Table 11: Multinomial Logit: Apprenticeship vs Public Institution

	Unadjusted Odds Ratios (95% CI)	P value	Adjusted Odds Ratios (95% CI)	P value
Apprenticeship				
Formality (ref=informal)	-1.07 (0.01, 0.84)	0.05	-0.47 (-0.93, -0.01)	0.04
Age	-0.02 (-2.55, 2.69)	0.96	-0.05 (-0.06, -0.03)	0.00
Education	-0.34 (-0.38, -0.29)	0.00	-0.36 (-0.44, -0.29)	0.00
Sex (ref=female)	-0.74 (-1.01, -0.47)	0.00	-0.79 (-1.25, -0.34)	0.00
Location (ref=urban)	1.06 (0.82, 1.30)	0.00	0.43 (0.01, 0.84)	0.05
Disability	-0.68 (-2.33, 0.96)	0.42	0.07 (-2.55, 2.69)	0.96

ix. Discussion

Access to skills training can be seen as an indirect way of creating employment and reducing poverty. As the working age population acquires skills they potentially improve their productivity which in turn has a positive effect on their working conditions. This makes skills acquisition an important aspect of job creation policies, at least in Africa.

In view of the above this study aimed at assessing the factors affecting participation in skills training in Zambia. It is envisaged that understanding of such factors will help those responsible for formulating skills development policies and development stakeholders formulate programmes that ensure as many people as want to acquire skills participate in training. This will in turn improve the quality of the Zambian labour force and increase prospective employees' chances of finding more decent work.

The small proportion of the labour force (6.3%) who had received skills training in 2012 indicate that in Zambia participation rates are very low. There is need therefore to increase participation in skills training as one way of improving labour force quality and resolving unemployment problems.

The mean age of the working age population stood at 32 years, signifying that Zambia's labor force is quite young. This partly explains why youth unemployment remains a problem in Zambia, higher (10.2%) than general unemployment (7.8%). More innovative approaches that recognise the demographic composition of the labor force should be pursued to end youth unemployment. Nonetheless and surprisingly, the mean age of skills training participants was 40 years, implying that the youth, who make up the majority of the labor force rarely participate in skills training. But this finding can be contested: the 2012 Labor Force survey defined the working age population as those who were aged 15 and above without defining an upper age limit. While the productive age in Zambia is considered to be from 15-64, the working age population was not defined so. It is therefore likely that ages beyond 65 influenced the mean. However, even after making an attempt to introduce an upper age limit, that is defining the working age population to be from 15-54, the mean of those participating in skills training still remained around 35 years, suggesting again that the young have fewer chances of participating in skills training. Policy should focus on attracting younger people in training who have a longer working life span than older participants.

The mean years of schooling for the general working age population and those who participated in skills training stood at 7.9 and 9.5 years respectively, suggesting that the majority of the labor force did not actually finish secondary school (normally 12 years). For skills training, many training institutions such as the public institutions require that one has completed secondary education for them to be considered. Lack of this is therefore another barrier to accessing skills training. Current data however show that secondary school transitions as well as completion rates have been improving in Zambia. Policies should focus on removing barriers in access to secondary education such as high school fees which has dominated debate currently.

Two factors investigated in this research indicated results which are at variance with much of the literature: the years of schooling and gender of a participant. Results show that an extra year of schooling increases the odds of participating in skills training significantly in both unadjusted and adjusted models. As discussed above, education attainment seems to be a big problem in the Zambian labor force. Skills training institutions in Zambia are still requiring individuals to have formal prior education as high as secondary level to participate

in skills training. This is not at par with the status quo in many African countries where technical and vocational education has been considered as a career path for the less academically endowed (Catherine, Jacob 2014). This may not be the case in Zambia according to the findings of this study. Policy needs a strong focus on education, especially secondary education. While Zambia has achieved the Millennium Development Goal target on universal primary education, issues of quality must be addressed as they affect whether a student moves from primary to secondary school and be able to complete. Additionally, and equally important, there is need to have a clear definition of the entry requirements to Skills training. Based on current evidence TEVETA may need to relax on the entry qualifications to match the prevailing context.

Access to skills training is also limited for females. Females tend to face systematic barriers to participation in skills training. Some of these include their domestic responsibilities such as child care and home making which takes up most of their time to do other things (Hartl 2009). Additionally, most skills curriculum rarely caters for the different needs of young women and reaches mostly young men. In Zambia for example a number of technical skills institutions tend to offer subjects that are dominated by males. It was only until recently when business management courses have taken centre stage and seems to create room for women's participation. A recent report by the TEVETA in Zambia also acknowledges that a number of youth and women are failing to have meaningful livelihoods because of lack of access to skills training (Kombe 2013). Furthermore, gender inequalities in access to skills training reflect the lower enrolment rates of women in secondary education in most African countries (AfDB/OECD 2008).

The results of the multinomial logistic reveal interesting trends regarding choices of skills training avenues (Table 4-6). Results show increasing the level of education reduces the likelihood of obtaining skills through on-the-job training and private institutions as compared to a public institution. This finding is consistent with literature. Usually, on-the-job training is more appealing to those who have lower levels of education. Additionally, the literature showed that public institutions tend to require prior qualifications such as completion of secondary school for one to be enrolled, which would make it more accessible to those with

more years of education. But this is different for private institutions especially those not-for-profit. In some cases even the for-profit institutions may not emphasize prior qualifications as much as do public institutions. Female participants were less likely than males to choose on-the-job training over public institution. The reason could be that generally females tend to have fewer chances of getting employment as they are not trained in any trade. Males on the contrary do. This makes females wanting to attend formal training institutions such as public institutions more inclined towards to obtaining formal qualifications before they can look for work.

Intuitively, as years of education increases an individual is less likely to choose apprenticeship over public institution. Indeed apprenticeship is more appealing to the less educated. In Zambia apprenticeship is mainly informal and rarely recognised by formal institutions. As such those who may have finished secondary education for example would seek a more formal institution such as public. Surprisingly, the study finds that those in the informal sector are less likely to choose apprenticeship over a public institution. However, this is counterintuitive as apprenticeship is predominant in informal settings. A possible explanation is that since apprenticeship is not formally recognised in Zambia participants would rather obtain skills from a public institution which is recognised and offers better employment prospects. But this may also warrant further investigation especially in terms of what type of skills training to which this finding may apply. Certain skills may not be offered in the informal sector leaving participants with no choice but to acquire them in public institutions.

Results also show that an individual in the urban area is more likely to choose apprenticeship over a public institution under the bivariate model. A possible explanation is that there is a greater prevalence in urban areas of informal work places such as carpentry workshops, tailoring and automotive repairs workshops. These are also usually free and voluntary than in public institutions. Under a multivariate model a person in the urban area is less likely to choose apprenticeship over public institution than one in the rural area. This is intuitive as most public institutions are in urban areas. Additionally public institutions are more formal and would be more accessible to urban residents than rural.

x. Limitations

The study was not without limitations. Firstly, the only data available was the 2012 Labour Force Survey which was done three years ago. This is a challenge as most of the indicators in the Zambian labour force might have changed by now. Similarly, it is possible that the dynamics of skills development in Zambia might have changed. Future studies could provide more accurate results by using more recent data.

Secondly, the literature review showed that income levels of households/individuals or socio-economic status has a significant role to play both in skills training participation and in deciding through which avenue to acquire training. However, the 2012 Labour Force Survey does not have a variable which classifies individuals and households according to their relative wealth standing. Indeed there is no household income or expenditure data collected in this type of survey. In future it would be useful to have this kind of variable to make it possible to compare people's chances of participating in skills training and the type of skills training avenue they would choose based on their socio-economic status. This is also useful in assessing how poverty affects one's trajectory in terms of skills acquisition and subsequent chances of finding employment.

The third and last limitation of the study is that 'Skills' according to the 2012 Labour Force Survey referred to crafts, or observable types of skills. This means that it is not possible to measure cognitive and non-cognitive skills. However, these are also important skills sets that an individual requires to be successful on their job and in other life activities. Future studies should be able to measure these kinds of skills. Some of them include basic literacy and numeracy which are useful in helping a person to learn new things and use information. Others are interpersonal skills such as problem-solving, communication, teamwork, self-confidence, aspiration and even entrepreneurial capabilities. While these may be difficult to measure they are very important and must be considered when measuring skills endowment.

Chapter Four

The findings of the first case study are very clear: health inequalities exist in Zambia and that stunting is determined by a combination of factors. Based on the findings, the study points out the following as critical in reducing health inequality and reducing child stunting:

- The distribution of stunting between rich and poor is a clear indication that health inequalities exist in Zambia. Therefore policy makers and programme implementers at various levels need to be cognisant of this fact and begin to fashion programmes that address such inequalities if meaningful progress is to be made on the various aspects of health.
- The disparities in stunting between rich and poor found in this study reflect disparities in access to important nutritional requirements that may be difficult to access by poor groups for various reasons, including affordability. With recent increases in food prices⁶ across the country, it may become even more difficult for Zambia significantly reduce child stunting and other nutrition related ailments. Policy should be aware of this fact and design programmes that ensure vulnerable families with children under the age of five have access to these nutritional requirements without discrimination. The current roll out of Social Cash Transfer schemes⁷ in Zambia which has been found to significantly improve the nutritional statuses of many households in a recommendable move which will contribute to ending child stunting. Additionally, policies and programmes that focus on women empowerment should be encouraged so that even those women without support from a man or husband can be able to provide for their children.
- The lack of access to nutritional requirements by the poor again reflects a lack of food security for low income groups in Zambia. Most of the foods such as those made from grains, roots, and tubers, including porridge and fortified baby food from grains; vitamin A-rich fruits and vegetables; eggs; meat, poultry, fish, and shellfish;

⁶ Zambia's inflation, mainly driven by rising food prices jumped from 7.3% in October 2015 to 14.3% in November 2015. By end of the year inflation had reached almost 20%.

⁷ Social Cash Transfer schemes (SCTs) have been running in Zambia for the past few years now. Targeted at the vulnerable in society SCTs have also been associated with improvements in child wellbeing: prevalence of diarrhoea has been reduced for households receiving money and more children have been able to receive minimum feeding requirements.

legumes and nuts can be produced at the household level without necessarily having to be bought. Thus one way of improving household nutrition and ultimately stunting is to promote food security at the household level. Rural residents especially can be able to engage in growing some of the foods. Policy should focus on expanding the current farm input subsidies⁸ to include strategic food crops which can potentially improve household food security and nutrition. Current farm subsidies seem to narrowly focus on maize growing which is not very nutritious especially for children.

- Education remains one of the most important factors associated with stunting. Improving the education of mothers is therefore key to reducing cases of stunting. However, this could be a long term measure and one can argue that current increases in primary school enrolment and improvements in school completion rates holds better things for mothers and children in the near future. In the short term, information dissemination in terms of nutritional requirements of children should be intensified not only to expecting mothers but to their spouses and other household members.
- The higher prevalence of stunting in rural areas compared to urban areas is a source of worry. Rural poverty currently stands at approximately 79%. This means that majority of the households are poor and cannot afford to provide meals that are required to raise healthy children. Incomes are also very low to afford basic requirements that are needed to meet minimum meal frequencies in many instances. Thus, fighting poverty remains key in the process of reducing stunting.

Lastly this paper has highlighted inequalities in health in Zambia using child stunting. The trends observed are a pointer that there could be many more inequalities in health. Future studies should include more health variables and assess them more comprehensively.

⁸ The Zambian government has been subsidizing farm inputs for many years but mainly for maize growing. While maize is a staple food for many households, it lacks the nutritional value needed for children if stunting is to be avoided. The subsidy needs to diversify into more nutritious crops like soya beans, fruits and vegetables.

The second case study has undertaken an analysis of the factors affecting participation in skills training and choice of Training Avenue. The study was necessitated by the realisation that skills have the potential to improve productivity and the economic well-being of participants.

Efforts are needed to encourage youths to participate in skills training. Zambia's population is generally young, meaning youths make for the larger part of the population. Increased access to skills training can help increase their chances of finding employment, reducing youth unemployment and ending destitution. As most of the youths drop out of school early there is need to strengthen and formalise apprenticeship as a way of servicing youth who have left the formal school system.

Education policies need to be strengthened. Zambia has achieved the MDG target on universal primary education, but quality of education remains a big problem. Classes are overcrowded and the pupil to teacher ratios remains unimaginably high. Primary school transition and secondary school completion rates have improved over years but more needs to be done. Policies that ensure girls have equal access to education as their male counterparts is an indirect way of facilitating access to skills training by this usually marginalized gender.

The study also brought out interesting issues on skills training avenues. It is interesting to see the high number of people acquiring skills through apprenticeship. Yet apprenticeship remains entirely informal and unrecognised by the formal TEVETA system. There is need to take deliberate steps to formalise apprenticeship as an important avenue for skills transfer as is the case in West Africa. While efforts are underway at TEVETA to introduce recognition of prior learning as well as trade setting for those in the informal sector, this should be scaled up and the speed of implementation hastened to quickly improve the quality of the labor force. Since apprenticeship mainly caters for the poor, rural residents and those with low education, it will give an opportunity even to people in the rural areas and those with no formal education an opportunity to learn a skill.

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