UNDERLYING DETERMINANTS OF STUNTING AMONG UNDER-5 CHILDREN IN UGANDAN CATTLE CORRIDOR.

By

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ABSTRACT

A study was undertaken to assess the underlying determinants(demographic and socio-economic) of stunting among under-5 children in Nakaseke and Nakasongola districts.

Secondary data from Africa Innovations Institute where 104 respondents were studied. Data management was done in Epidata and SPSS softwares. Women who did pastoralism as their occupation were less likely to have stunted children than women who did peasantry as reference category.

In conclusion, there is need to obtain primary data at an appropriate time, taking into consideration, the use of an appropriate indicator and data collection should explore beyond the socio-economic and demographic factors explored in this study.

KEY WORDS**: Height, Under-5, Pearson and Anthropometry**

1.0 INTRODUCTION

In Uganda, stunting remains a serious health and welfare problem affecting children to whom it contributes significantly to mortality and morbidity. Over 38% of children below five years are stunted (Serunjogi, 1992; UDHS 2006).

Stunting in Uganda starts at infancy and rises steeply, peaking at about two years when about 50% of toddlers are stunted. The Northern (40%) and South Western (50%) regions are more affected than other regions (UBOS & Macro International Inc, 2007).

Stunting among children is an outcome of many interrelated factors including environment, economics, education, and culture and food security. Among these, the ones that have immediate and direct effects on stunting are feeding practices and infections. Therefore the nutrition levels of children can indicate the socio economic development of a community.

The Uganda food and nutrition policy targets nutrition and childhood development with the overall objective of improving health of children less than six years of age. Policies are being formulated to address nutrition priority problems with assistance from international and local agencies. The 2004/2005 policy reform has been working on policies and guidelines on anaemia, breastfeeding and HIV/AIDS and a number of other nutrition related disorders prevalent in the country.

Uganda government has put tremendous efforts in reducing the prevalence of both micronutrient and macronutrient deficiencies in the country, for instance through effective nutrition programs which act directly on feeding practices. However, the yield would be more significant if the government acted through factors that affect stunting of children. In addition, addressing the plight of women by strategically targeting their economic, education, and health status can improve nutrition household level since women are the principle providers and care givers of children at this level. Natif (2000) mentioned lack of information about magnitude, nature, scope and severity of malnutrition. She also noted that poorly coordinated approaches to malnutrition problems in the relevant sectors and adequate research, sensitization and mobilization to be major causes of malnutrition threats.

Effective nutrition is one of the most important health determinants among citizens of any country including Uganda. However, malnutrition remains a big threat to almost all regions in Uganda particularly in the districts of Nakaseke and Nakasongola.

Most children have been seen to be generally weak with thin gray-blond hair, some with diarrhoea, as well as in poor hygienic conditions in the Ugandan cattle corridors. Most children had not gained the corresponding body weight which leads to premature death later in life because vital organs are never fully develop during childhood.

Data from the previous four Uganda Demographic Health Surveys (1989,1995,2001,2006) show that the nutrition indicators have not improved much over the past 15 years and some indicators have even shown a worsening trend. For example the UDHS 2006 reported 16% of children under five in Uganda are underweight, 38% are stunted and 6.1% are wasted.

An operation framework for nutrition in terms of child survival strategies was developed by the Government of Uganda in 2009. Recently, Government also launched a National Development Plan from 2010-2015 which also focuses on nutritional wellbeing of children. Besides, food and nutrition policy was enacted by the government of Uganda in 2003 as well as the implementation of the global Millennium Development Goals which still emphasize the stunting of children below five years (MoH, 2009).

Absence of information on child stunting in Nakaseke and Nakasongola districts which are part of the Ugandan cattle corridor has prompted the researcher to add on the existing information about the subject.

This study assessed the underlying determinants of stunting of under-5 children in Nakaseke and Nakasongola cattle corridor districts to make recommendations to improve the nutritional status of once the prevalent and determinants stunting are identified.

The main objective of the study was to assess underlying determinants of stunting among under-5 children in Nakaseke and Nakasongola districts and the specific objectives include; (i).To assess the effect of socio-economic factors on stunting of children below five years. (ii). To ascertain the relationship between the demographic factors and stunting of children below five years.

Hypotheses of the study that were tested included among others;

i. Age of the child does not affect the stunting of under-5 children.
ii. The sex of a child does not affect the stunting of under-5 children
iii. Mothersô age does not affect the stunting of under-5 children
iv. Household size does not influence the stunting of under-5 children
v. Maternal education does not affect the stunting of under-5 children
vi. Wealth index of the household does not influence the stunting of under-5 children
vii. There is no relationship between marital status of the respondent and the stunting of under-5 children

2.0 METHODS

The target population included children below five years in the cattle corridors of Nakasongola and Nakaseke districts. The sites were selected based on the presence of the IDRC Project on climate change with a potential negative impact on nutrition. Secondary data was obtained with consent from project implemented by the Africa Innovations Institute (AfrII) under their theme ñAdaptation to the impact of climatic variability on food and Health security in the cattle corridor of Ugandaò funded by International Development Research Centre, Canada.

In total, secondary data was obtained from Africa Innovations Institute (AfrII) which had visited and interviewed 104 households during the months of July and August 2011. Due to non-response during the study, the sample size of the respondents was less than 104 on most variables that were considered during the study.

Standard assessment of nutritional status was done using anthropometry as described by Gibson (2005). Height/length was measured in duplicate to the nearest 0.1 cm using a standiometer. Age was verified using birth certificates, immunization cards or local events calendars (Kikafunda, 2006). Other observations were made on symptoms of major nutritional deficiencies including Protein-Energy Malnutrition (PEM) and

micronutrient deficiencies including Anaemia (Iron Deficiency anaemia (IDA), Vitamin A Deficiency (VAD) and Iodine Deficiency Disorder (IDD).

Anthropometric data (age, sex and height/length) were entered in ENA software (Version 2011) to obtain standardized z- scores of height-for-age (haz), weight-for-age (waz) and weight-for-height). Only the height-for-age index was used as proxy for linear growth retardation and cumulative growth deficits in the analysis. Children with height-for-age Z-score below minus two standard deviations (-2 SD) were considered short for their age (stunted) and chronically malnourished. Children who were below minus three standard deviations (-3 SD) are considered severely stunted.

Socioeconomic and demographic data were entered in excel together with standardized scores of height for age before being exported to an appropriate statistical package for analysis. Whereas univariate and bivariate analyses were done using Statistical Package for Social Scientists (SPSS) version 16.0, multivariate analysis was done using Stata version 11.

Univariate analyses were summarised as frequency distribution tables, graphs and pie-charts, histograms and various measures of central tendency like the mean and median for easy interpretation. Bivariate analyses were performed with cross tabulations and Pearson chi square (χ^2) to establish the relationship between the independent variables and stunting. The Pearson Chi Square (χ^2) test was derived as follows.

$$\chi^2 = \sum\left(\frac{(O-E)^2}{E}\right) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.1$$

With (n-1) degrees of freedom; O is the observed frequency and E is the expected frequency.

Variables with significant associations on stunting from bivariate analyses were entered as potential determinants of stunting in multivariate analyses in logistic regression model using a dichotomous variable as (1= Stunted, 0 = Not Stunted) as the dependent variable. The model estimated the probability of falling into either of the dichotomous values of the dependent variable given the effect of the independent variables.

The logistic regression model is displayed below;

$$Logit(Stunting) = \log\left(\frac{p}{1-p}\right) = \beta_o + \beta_1 dmale + \beta_2 dfem + \beta_3 dbirth\_order + \beta_4 dbirth\_\text{int}erval$$
$$+ \beta_5 dmatern\_age + \beta_6 dmarried + \beta_7 dnot\_married + \beta_7 dprim + \beta_8 d\sec^{+} + \beta_9 dpeasant +$$
$$\beta_{10} dpastoralist + \beta_{11} dbu\sin + .\beta_{12} dhandcraft + \beta_{13} dother \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.2$$

Where; β_0 is a constant.

β_{1-13} are unknown coefficients.

p is the probability of having a stunted child.

Limitations of the study

The researcher found some challenges while using the available dataset in the study since it was collected for other specific purposes and not necessarily on the nutrition status of children below five years. Hence it left out variables of interest.

3.0 STUDY RESULTS

All the socio-demographic characteristics of the respondents were presented in table 1.0 below.

Table 1.0: Socio-demographic characteristics of study respondents

Characteristic	Frequency	Percentage
Sex of child (N=87)	**39**	**44.83**
Male	48	55.17
Female		
Birth Order (78)		
1-2	**43**	**55.13**
3-4	18	23.08
5 or more	17	21.79
Birth Interval (years) (N=61)		
1-2	38	62.30
3-4	17	27.87
5 or more	6	9.84
Child's biological mother alive (N=90)		
Yes	88	97.8
No	2	2.2
Child's biological father alive (N=87)		
Yes	81	93.1
No	4	4.6
Donôt know	2	2.3
Marital status of child's mother (N=90)		
Never Married/Separated	55	61.08
Married/Cohabiting	35	38.92
Education of mother (79)		
None	11	13.92
Primary (1-7 yrs)	57	72.15
Secondary (8-13)	9	11.39
University/Tertiary (13+)	2	2.53
Maternal occupation (N=39)		
Peasant farmer	44	57.89
Civil Servant	2	2.63
Pastoralist	11	14.47
Business	13	17.11
Handcrafts	2	2.63
Others	4	5.26

Findings on the sex composition of children indicate that majority (55.2%) were females while males were (44.8%) an indication of sex ratio in the two districts of Nakasongola and Nakaseke greater than 100.

Majority children (55.1%) were in the birth order of 1-2, this was followed by (23.1%) in the birth order of 3-4. Most children (62%) were spaced between the intervals of 1-2years, followed by 3-4 years (28%) while (10%) were spaced over 4 years. The least number of children (3%) were in the birth interval of 4-5 years.

Most children were living with their biological mothers (97.8%) and fathers(93.1%). Majority of the women who took care of the children were either never married or separated(61.08%). On the education status of the women, majority of them had completed primary seven(72.15%). On the maternal occupation, majority of the respondents were peasant farmers(57.89%) followed by those who were engaged in business.

Table 2.0: Child immunisation and Vitamin A Supplementation status

Child Status	Frequency (N)	Percentage (%)
Child immunized for measles (N=87)		
Immunized up to date according to EPI card	51	58.6
Has measles immunization scar	1	1.1
fully immunized according to the mother	29	33.3
Not immunized (> 9months)	4	4.6
Less than 9 months old (not immunized)	1	1.1
Do not know	1	1.1
BCG immunization status (N=87)		
Immunized up to date	28	32.2
Has BCG scar	39	44.8
Immunized according to the mother	16	18.4
Not immunized	3	3.4
Do not know	1	1.1
Vitamin A administration (N=86)		
Administered according to EPI card	48	55.8
Administered according to the mother	32	37.2
Not administered	2	2.3
Do not know	4	4.7

According to the analysis results in table two above on the immunisation status of the child, it was found out that the majority of the children (58.6%) were immunized up to date according to EPI card, 33.3% of the children were immunized fully according to the mother and only 1.1% had measles immunization scars.

The BCG immunization status of the children was analysed and it was found that most of the children had BCG scars while 32.2% of the children had been immunized up to date, 18.4% were immunized according to the mother and 3.4% of the children were not immunized.

It can be noticed that majority of children had acquired vitamin A supplement according to EPI card (55.8%) followed by those children who were administered according to their mother(37.2%).

Table 3.0: Bivariate associations between demographic characteristics and child Stunting

Characteristic	Child's nutrition status		χ^2	P-Value
	Not stunted N (%)	Stunted N (%)		
Sex of child (N=87)	**34 (39.1)**	**53 (60.9)**	**0.011**	**0.915**
Male	15 (38.5)	24 (61.5)		
Female	19 (39.6)	29 (60.4)		
Birth order (N=78)	**33 (42.3)**	**45 (57.7)**	**5.02**	**0.170**
1-2	19 (44.2)	24 (55.8)		
3-4	8 (44.4)	10 (55.6)		
5+	6 (35.3)	11 (64.7)		
Birth interval (N=61)	**27 (44.3)**	**34 (55.7)**	**5.42**	**0.143**
1-2 Years	15 (39.5)	23 (60.5)		
3-4 Years	11 (64.7)	6 (35.3)		
5+ Years	1 (16.7)	5 (83.3)		
Child age interval (N=109)	**42 (38.5)**	**67 (61.5)**	**5.28**	**0.626**
Below 11 Months	29 (44.6)	36 (55.4)		
12-23 Months	4 (26.6)	11 (73.4)		
24-59 Months	28 (58.3)	20 (41.7)		
Maternal age (N=87)	**36 (41.4)**	**51 (58.6)**	**6.97**	**0.534**
<20 Years	6 (37.5)	10 (62.5)		
20-29 Years	13 (43.3)	17 (56.7)		
30-39 Years	15 (27.4)	57 (72.6)		
40-49 Years	2 (22.2)	7 (77.8)		
Maternal Education (N=90)	**37 (41)**	**53 (58.8)**	**9.44**	**0.150**
No Education	4 (44.4)	5 (55.6)		
Primary Education	24 (35.8)	43 (64.2)		
Secondary Education	7 (70)	3 (30)		
Tertiary/University	2 (50)	2 (50)		
Maternal occupation (N=76)	**32 (42.1)**	**44 (57.9)**	**11.03**	**0.026**
Peasant farmer	20 (45.5)	24 (54.5)		
Civil servant	-	2 (100.0)		
Pastoralist	1 (9.1)	10 (90.9)		
Business	9 (69.2)	4 (30.8)		
Handcrafts	2 (33)	4 (66.7)		
Marital status (90)	**36 (40.0)**	**54 (60.0)**	**1.42**	**0.700**
Never married/Separated	20 (36.4)	35 (63.6)		
Married/Cohabiting	16 (45.7)	19 (54.2)		

The findings in table 4.8 above indicates that both socio economic and demographic factors did not have significant association with stunting except maternal occupation(p-value=0.026). The table further reveals that stunting was higher among children from mothers who were peasant farmers (44%) as their occupation than other occupations.

Table 4.0: Regression analysis output on the determinants of stunting among under-5 children in Ugandan cattle corridor.

childstunt~d	Odds Ratio	Std.Err.	z	P>z	[95% Conf.	Interval]
dpeasant**	1					
dpastoralist	0.12	0.130996	-1.94	0.051*	0.0141247	1.019489
dbusiness	2.7	1.816797	1.48	0.14	0.7221057	10.09548
dhandcrafts	1.2	1.735511	0.13	0.9	0.0704893	20.42865
dothers	0.4	0.477494	-0.77	0.443	0.0385436	4.151145
Number of obs = 74			**LR chi2(4) = 10.54**			
Prob > chi2 = 0.0318			**Log likelihood = -45.327182**			
Pseudo R2 = 0.0878						

**** Reference category**

Women occupation like any other socio-economic variable is paramount in influencing child stunting in the Ugandan cattle corridor of Nakaseke and Nakasongola districts. Mothers who did pastoralism as their occupation were less likely to have stunted children than mothers who were peasants (OR=0.12).

Dummies for women engaged in general businesses as well as handcrafts were found statistically insignificant save women who did pastoralism (pr=0.051*) as their occupation. Women engaged in pastoralism in the cattle corridor are known to supplement their nutrition values of their children with nutritious cow milk which reduces the risk of them being stunted. This is in-most cases not necessarily true among women with other occupations like peasantry and general business.

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