Parental Care on Under Five Child Health Outcomes in Zimbabwe

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PARENTAL CARE ON UNDER FIVE CHILD HEALTH OUTCOMES IN ZIMBABWE

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Abstract

This study examines the effect of parental care on child health outcomes (stunting, wasting and underweight) in Zimbabwe. The study uses data from the Zimbabwe Demographic Health Survey (ZDHS) (1994-2015) by employing the Ordinary Least Method (OLS) regression approach. The results indicate that breastfeeding and vaccination on each count has a significant negative effect on under-five child health outcomes (stunting and wasting). On the contrary, child size shows a significant positive effect on wasting and underweight among under-five children in Zimbabwe. Area of residence indicates an under five-child in an urban centre is less likely to be wasting compared to its contemporary in a rural area. The individual effects of mother's education, wealth index, child's sex and marital status shows insignificant effects on under-five child health outcomes. The policy implication is that health professionals should intensify education on early child suckling and succeeding dietary mix to obviate poor health outcomes. This study also implores the Ministry of Health and Child Care in Zimbabwe to review existing vaccination programmes by extending to households with poor child health outcomes found in inaccessible areas. As a contribution, this study provides a platform for deliberations on family care and child health care in African societies.

Keywords: Child health outcome, anthropometric measures, parental care, demographic health survey, Zimbabwe

JEL classification I1, I3,I110, I120

Introduction

Efforts to improve child health outcomes continue to be a contemporary, pertinent and one of the most pressing issues in the circles of children's development. Hence, it has featured prominently among current world leaders discussions on global developmental targets specifically the Millennium Development Goals (MDGs) and its successor, the Sustainable Development Goals (SDGs). This is against the backdrop that child nutritional status is an important outcome measure of children's health (NBS & ICF Macro, 2011) however; negative repercussions on children's wellbeing transcend beyond childhood (Lichter, 2007) and translate to a sick adult population.

Within the family setting, mothers play significant roles in influencing a child's health outcomes in their formative years. Given that mothers play critical roles in children's health, a large body of research dating back at least to the 1980's (e.g., Mechanic, 1980) has focused on maternal care behaviors that explain variations in child's health outcomes. Prior health studies confirm that a varied variables including health, psychological and social characteristics impact early health care services that mothers provide for their children. Specifically, mother's own use of health services is predicted to have a positive associated with their children's health care, reflecting similarities in health outcomes and patterns of help seeking between generations (Broadhurst, 2003; Janicke, Finney & Riley, 2001). Global health discussions have now centered on under-five children since poor nutrition among such children reveals itself in anthropometric measures (underweight, stunting and wasting). These perspectives of nutrition and childhood diseases have attracted global public health concerns especially in Sub-Saharan Africa.

Even though the African sub-region is regarded one of the richest continents due to its large family sizes with numerous children, not many efforts have been made in achieving the SDG goal of improving child survival and development (United Nations, 2011). However, a systematic analysis of trends in stunting and underweight among children as well as the progress towards achieving the MDG 1, using data obtained from 141 developing countries showed that moderate and severe stunting in children has declined from 47.2% to 29.9% between 1985 and 2011. According to Amsalu & Tigabu (2008), high incidence of child morbidity and mortality in developing countries is highly attributed to poor maternal care provided to children at their earlier and fragile years.

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The advent of urbanization coupled with demanding job responsibilities have constrained mothers' efforts in providing child care hence a high number of mothers shirk their responsibilities to either home care providers or other extended family members. Biological mothers continue to rely on childcare services provided by caregivers (nannies) and sometimes extended family members to cater for the health and physiological needs of children. However, meeting the health needs of children transcends beyond economic means. Caregivers and extended family members are unable to provide a holistic care that parents can offer children in order to grow well. This has resulted in most under-five children showing poor health outcomes (stunting, wasting and underweight).

Poor health outcomes among under-five children cut cross many geographical jurisdictions in SSA resulting from failure to provide adequate care for infantile groups. Health outcomes among under-five children in Zimbabwe is very pronounced as reflected in the percentage of under-five children who exhibit poor health outcomes. There have been cases of child irregular food intake pattern, inappropriate child medication, child abuse and lack of physical activities for under-five children having negative toll on children health outcomes.

Existing conceptual and empirical research on parental care predictor relationship and under-five children health outcomes have focused on either the effect of parent-child interaction or parental behaviours on child behavior. Schor (1995) indicated that the quality of interactions between a parent and child is key to developing quality time, empathy and strengthen intimate relationships. In the same vein, O'Connor & Scott (2007) analysed the extent to which parents who exhibit elevated rates of conflict and harsh parenting behaviours influence their children's behavior in exhibiting delinquent behaviours. Plantin (2001) also delved deep into fathers' active involvement in childcare and have a positively effect on health outcomes for themselves, their partners and immediate offspring across Europe. Though these studies are revealing, the literature fails to employ a survey data from a demographic health survey to analsye the effect of parental care on under-five children's health outcomes (stunting, wasting and overweight). It is against this background that the study uses data from the Zimbabawe Demographic Health Survey to analyse the effect of parental care on under-five child health outcomes. This study will test whether and the extent to which parental care influence under-five children health outcomes. This is premised

on the fact that the sort of parental care and its effect on under-five children health outcomes are only mostly gleaned from open discourse deprived of any pragmatic content.

The rest of the paper is organised as follows. Section 2 presents a review of literature (theoretical) and empirical evidence on child health outcomes. Section 3 deals with research methods (estimation technique, data source and variables description). The results and discussion are presented in Section 4 and section 5 concludes the paper with gap and conclusion.

Review of Literature

Child health Outcomes

Disparities in child health outcomes persist across the globe despite several attempts to improve well-being of children. Various epidemiological studies have identified that variations in factors that determine child health outcomes across various contexts, explain the variations in child health outcomes. Several theories and conceptual frameworks have also been developed to explain these variations. The survival of a child in the first and subsequent weeks and years depends on a number of socioeconomic, biological, environmental and cultural factors (Venkatacharya and Tesfay, 1986).

Chakraborty (2005) highlighted that the most prominent causes of variations in child health outcomes are levels of poverty, parental education, nutrition as well as environment of residence. In instances of poor households (families), the mother is less likely to be able to afford healthcare for the infant and in some instances delivers at home such that the infant is not likely to be vaccinated. Ogada (2012) put forward the argument that mother's education is important in allowing her to make sound choices regarding the child's health and seeking out healthcare, and understanding the importance of adhering to vaccination requirements for instance.

Ecological System Theory

Urie Bronfenbrenner (2005) also developed an ecological system theory to explain how child's environment affects how a child grows and develops. The ecological theory postulates that the child health outcome is a result of the interaction of the child's macro, micro and eco systems where the macro system is made up of factors such as relative freedoms permitted by the national government, cultural values, the economy, wars etc. which can affect a child either positively or

negatively. The micro system is composed of the immediate relationships or organizations they interact with, such as their immediate family or caregivers and their school or day care. Under this framework, parental care also plays a key role as a factor influencing child health. The ecosystem is made up of the environment that the child rarely interacts with, but has huge influence of child's development. Such factors may include the state of the neighborhood, and extended family as these have an indirect impact on quality of care and attention provided to the child.

Mosley and Chen (1984) developed a framework for child health using child mortality/survival as an indicator of child health. The framework postulates that all social and economic determinants of child mortality necessarily operate through a common set of biological mechanisms or proximate determinants (intermediate variables) to directly influence the chances of survival. The maternal factors such as age, parity and birth interval have been shown to exert an independent influence on pregnancy outcome and infant survival through their effects on maternal health.

Mother's health and nutritional status as well as her reproductive pattern influence the health and survival, allowing for longer duration of breastfeeding which in turn feeds into the child health outcomes during pregnancy as well as in the infancy years. Environmental factors also affected child mortality or child survival such that children born in environments where conditions are good and well taken care of survive more than those born in deplorable environments like slum areas of urban centers where contamination of the environment, lack of quality water for domestic use and limited toilet facilities are a characteristic. The socioeconomic determinants (independent variables) operate through the proximate determinants to influence the level of growth faltering and mortality.

Empirical literature

It has emerged from cross-country comparisons that mother's education (Caldwell 1979, Mensch et al. 1983; Simmons and Bernstein, 1982) and together with the work of other studies, have established a correlation between variables such as literacy, mother's place of residence and expenditure on health and infant and child mortality. Empirically, vaccination has been associated with improved health outcomes across the world (Mondal 2009; Zwedu, 2010; Eiselle et al 2012; Fischer and Walker 2014). Other factors such as personal hygiene of the mother and child, toilet

facilities, safe water supply and prevalence of diseases in the environment also influence child survival.

In developing countries, background characteristics such as mother's literacy, urban or rural residence and household economic status are likely to affect a child's condition at birth as well as its environment, thus affecting infant and child mortality (Hobcraft, et al.,1984; Mosley and Chen, 1984; United Nations, 1985). A study done by Baker (1999) and Espo (2002) in Zambia revealed that the age of the mother and the breastfeeding duration were significant in reducing child health mortality and consequently improvement of health. Other studies done in developing countries such as Vietnam, Malawi and India have also confirmed that children weaned early. Previous studies also revealed that vaccination plays a pivotal role in improving health outcomes as posited by studies by Mondal (2009); Babale (2013); Kiyen et al (2010) and Guerera (2013) and Chizoba et al (2013) found a positive correlation between immunization and child health outcomes.

Research Methods

Estimation strategy

The researchers adopted the Cobb–Douglass production function in which output (Y) is determined by two factors, capital (K) and labor (L) as laid out in the Solow's model (Cobb & Douglas, 1928). Defining output per worker (y) and capital per worker (k), the production function takes the following form:

$Y = f(K_t, L_t)$ …………………………………………………………………….. (1)

Based on theoretical and empirical evidence, the paper captures some variables that affect child health outcomes in Zimbabwe as follows:

$HO = f(BF_t, VC_t, W_t, SEX_t, CS_t, M_t, MA_t, ME_t, WS_t, R_t)$ ……………………….….. (2)

Where HO is the health outcomes (stunting, wasting and underweight), BF is Breastfeeding, VC is vaccination, W is wealth, SEX is the sex of the child, CS is the child size, MS is the mother's marital status, MA is the mother's age, ME is the mother's educational level, WS is the household water source and R is the residence.

By applying the Ordinary Least Square (OLS), we derive equation (3)

$$HO_t = \alpha_i + \beta_1 BF_t + \beta_2 VC_t + \beta_3 W_t + \beta_4 SEX_t + \beta_5 CS_t + \beta_6 MS_t + \beta_7 MA_t + \beta_8 ME_t + \beta_9 WS_t + \beta_{10} R_t + e_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3)$$

Data Source

This study uses data derived from five Zimbabwe Demographic and Health Surveys (ZDHS). The various demographic and health surveys were conducted at irregular intervals. Data from the 1994, 1999, 2005, 2010 and 2015 ZDHS provide the background and framework for trends in households' health outcomes. The ZDHS is a nationwide representative survey of health, demographic and other allied issues important to development, conducted among women age 15-49 and men age 15-54. The household member and children's recode datasets are merged and used for analysis. The household member dataset represents background information on all members of the household, while the children's dataset gives information on children under age of five of interviewed women.

Measurement of key variables

This study adapts the UNICEF (1990) model for studying malnutrition to investigate three dimensions of child health outcomes, height-for-age (stunting), weight-for-height (underweight) and weight-for-age (wasting). According to the model, nutritional status is the outcome of the interplay among basic, underlying and immediate factors. The basic factors consist of structural characteristics—region and urban-rural residence and background (remote)—and household characteristics – wealth index and sources of drinking water—as well as maternal characteristics—education, marital status and age. These in turn indirectly influence the underlying factors of child-related variables, and directly influence the immediate factors that lead to nutritional status.

Table 1. Measurement of variables

Variable	Measurement/units
Height-for-age *z*-score	(Child's height-median of ref. group)/SD of ref. group
Weight for-height *z*-score	(Child's weight-median of ref. group)/SD of ref. group (same height)
Weight-for-age *z*-score	Child's weight-median of ref. group)/SD of ref. group
Breastfeeding	Duration of breastfeeding in months
Vaccination	A child ever had a vaccination
Sex of child	Male child =1; female child = 0
Child's size at birth	A proxy for initial health status

	Very large =1; average=2
Wealth index	Asset index
Mother's age	Mother's age captured as completed years
Mother's educational level	No education = 0; primary =1; secondary = 2; higher =3
Mother's marital status	Never married =1; currently married = 2
Household source of water	Pipe/bottled water =1; other = 0
Residence	Rural = 0; urban =1

Source: Gamette et al. (2020)

Description of variables

Child health outcomes

Child health outcomes are measured using anthropometric indicators of height-for-age, weight-for-height and weight-for-age. The indicators are captured as z-scores with values in the range of ±6 and thresholds for classifying nutritional status (WHO, 2006). Children with z-scores less than -2 for height-for-age, weight-for-height and weight-for-age are classified, respectively, as stunted, wasted or underweight. Stunting is a measure of chronic malnourishment, whereas wasting is a measure of acute malnourishment, and underweight reflects both acute and chronic under nutrition. In this paper, the classifications are used for the inferential analysis.

Breast-feeding

This variable is used as a proxy for the mother's care on child health outcome. It is measured as number of months at which the mother has breastfed the child. Exclusive breastfeeding reduces infant mortality due to common childhood illnesses such as diarrhea or pneumonia and helps for a quicker recovery during illness. We expect the negative relationship between breast-feeding and all the anthropometric measures.

Vaccination

The percentage of children who receive specific vaccines according to vaccination card. It is expected that vaccination will have negative effect on child health outcome.

Mother's education

More-educated mother may be better informed about the availability and use of health care, or have better health behavior that confers benefits to their children. We expect negative relationship between mother's education and child health outcomes used in this study.

Wealth index

It is a composite measure of household's cumulative living standard. Wealth index is calculated using data on household's ownership of selected assets and types of water access and sanitation facilities. Wealthier households are able to allocate more resources to other goods (such as better food or cleaner home environments) that improve health, so the wealth index is expected to negatively affect the anthropometric measures.

Results and Discussion

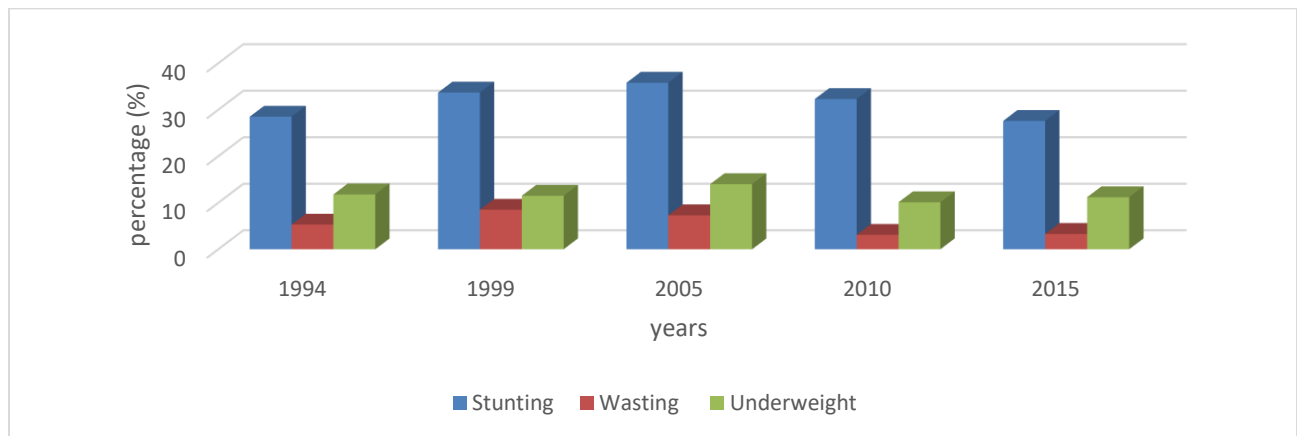**Trend of Health Outcomes of under five year children in Zimbabwe (1994-2015)**

Fig. 1: Trend of health outcomes dimensions - stunting, underweight and wasting of under five children in Zimbabwe (1994-2015)

Source: Gamette et al. (2020)

From figure 1 above, all the anthropometric measures (stunting, wasting and underweight) among under five children show increasing trends with each reaching a maximum and eventually begins to show a downward trend. It also shows that stunting among children under five years in Zimbabwe was highest (35.8%) in 2005. Underweight and wasting got to their peaks at 11.8%,

(1994) and 8.5% (1999) respectively. On the other hand, stunting, wasting and underweight have their lowest recorded values at 27.6% (2015), 3.1% (2010) and 10.1% (2010) respectively.

Moreover, these anthropometric indicators vary from one geographical to another. Stunting levels vary geographically from 19 percent in Bulawayo province to 31 percent in Matabeleland South, and are higher in rural areas (29 percent) than urban areas (22 percent). Differences in stunting levels can also be attributed to maternal education and wealth levels—25 percent of children whose mothers have secondary education are stunted, while the prevalence rises to 45 percent of children whose mothers had no formal education.

At 6 percent, prevalence of thinness among women 15–49 years has reduced slightly since 2010–2011 (ZNSA and ICF, 2016). Poor infant and young child feeding practices contribute to child malnutrition in Zimbabwe. Moreover, exclusive breastfeeding prevalence further decreases to only 20 percent among children 4–5 months. Among children 6–23 months, only 10 percent are fed a minimally acceptable diet with appropriate frequency and diversity.

Effects of Mother's Care on Child Health Outcomes in 2015

Table 2. Linear regression results of the relationship between child health outcomes and Breastfeeding, Vaccination and other covariates, Zimbabwe 2015

Explanatory variable	Stunting		Wasting		Underweight	
	Coeff.	t-statistic	Coeff.	t-statistic	Coeff.	t-statistic
Breastfeeding	-0.139747*	(-2.47)	-.0604403*	(-2.00)	-.0350252	(-1.58)
Vaccination	-0.039592*	(-2.53)	-.0577664*	(-1.91)	-.0344726	(-1.56)
Wealth index	.0021425	(0.13)	-.2125778	(-1.75)	-.0174516	(-0.20)
Male child	-.0170193	(-1.75)	-.0946465	(-1.35)	.0166324	(0.32)
Child's size at birth (average)	.0328698	(1.82)	.2898703*	(2.24)	.2408098*	(2.54)
Marital Status	.0033113	(0.13)	.2858911	(1.56)	.0211066	(0.16)
Mother's age	-.001068	(-1.29)	-.0007373	(-0.12)	-.0059854	(-1.37)

Mother's education (primary)	-.0401229	(-0.83)	.0377083	(0.11)	.1090957	(0.43)
Mother's education (secondary)	-.0443932	(-0.92)	.1178355	(0.34)	.0762019	(0.30)
Mother's education (Higher)	-.0068888	(-0.13)	.0474339	(0.12)	-.0487399	(-0.17)
Household source of water	-.0006682	(-0.15)	.0098215	(0.31)	-.005755	(-0.25)
Urban residence	.0180278	(0.80)	-.332715*	(-2.05)	-.0091236	(-0.08)
Constant	-.9597188	(-1.24)	-11.04355	(-1.99)	-5.564789	(-1.36)
N	678		678		678	
R^2	0.0409		0.0237		0.0165	
F-statistics	3.99		2.27		1.57	
	(0.0000)		(0.0001)		(0.0199)	

Reference groups: no education; rural residence.

*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

The results from table 2 show that breastfeeding significantly affects stunting and wasting but does not influence underweight of a child. Increase in months of breastfeeding would reduce stunting and wasting by 0.13 and 0.06 respectively. These results are in line with our expectations. Breast milk is the natural first food for babies. It provides all the energy and nutrients that the infant needs for the first months of life and it continues to provide up to half or more of a child's nutritional needs during the second half of the first year, and up to one-third during the second year of life (WHO, 2006). Vaccination also has a significant negative effect on stunting and wasting but does not influence underweight. The results are consistent with findings from studies (Mondal, 2009; Eiselle et al 2012; Fischer & Walker, 2014) indicating vaccination has a significant influence in determining child health outcomes.

Child size a proxy for health status at birth shows a significant positive effect on wasting

and overweight among under-five children in Zimbabwe. Specifically, under five child with average size are 0.2898703 and 0.2408098 more likely to showing acute malnutrition symptom (wasting) and chronic malnutrition symptoms (underweight) comparable to under five child who is very large in size at birth. Residential area (urban) was discovered to have a negative effect on under-five at a 10% significance level. Intuitively, under five child in urban areas has 0.332715 less showing acute malnutrition symptoms (wasting) than their counterparts in rural areas. This is consistent with findings of Hobcraft, et al. (1984) suggesting residential space has effect on infant and child health outcomes. Wealth, child's sex, marital status, mother's age, mother's education and household source of water have no significant impact on all the three child health outcomes in Zimbabwe.

Research Gap & Conclusion

The aim of this study was to examine the effect of parental care on under-five child health outcomes in Zimbabwe. The child health outcome is a continuous variable measured with three anthropometric indicators; weight-for-height (wasting), height-for-age (stunting) and weight-for-age (underweight) This paper showed the trends in child health outcomes in 1994-2015 as well as examined the effect of parental care on under-five child health outcomes in Zimbabwe. Understanding the factors and channels that influence child health outcomes has become important in view of the short-term and long-term implications of good health, both for individuals and for national development (Black et al. 2013). Breast-feeding as a proxy for mother's care was found to be significant in determining the child health outcome. Increase in months of breastfeeding reduces stunting and wasting. Vaccination and child size at birth are also significant in influencing the anthropometric measures. Under-five child with average body size at birth was more susceptible to showing symptoms of being wasting and underweight than a child with very large body size at birth. Residential place played a significant role in determining under-five child health care in Zimbabwe. Specifically, under-five in urban areas had better health outcomes than their counterparts in the rural areas.

Policy Implications

In terms of policy, the article suggests that in order to improve health outcomes of under-five children, health professionals should intensify nutritional education on breastfeeding. This will inform mothers on the need to breastfeed their child during formative years especially for at

least six months. Moreover, the Ministry of Health and Child Care in Zimbabwe should revise current vaccination strategies and expand vaccination programmes targeting more remote areas.

Limitation of the Study

The key limitation of this study was that all information were obtained from a survey data. Measures related to parental care (mother's care) and child health outcomes were mother-reported which could result in self- report bias because of social desirability related to being a caring mother. However, because data was not available for male parents, future studies could also focus on including male parents. Despite the data limitation, the findings from this study could still be counted on in the quest to improve under-five year health outcomes. The researcher proposed that future studies on this subject matter can concentrate a comparative study based on SSA sub-regions.

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APPENDIX

APPENDIX A: Summary statistics of variables used for inferential statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Stunting	3125.00	0.02	0.42	-5.67	4.45
Wasting	3125.00	0.13	1.98	-5.98	5.96
Underweight	3125.00	0.37	1.47	-5.94	5.89
Vaccination	3125.00	92.01	0.63	92.00	94.00
Age of Child	3125.00	34.58	14.05	1.00	59.00
Breastfeeding	3125.00	93.32	0.72	93.00	95.00
Child size	3125.00	2.74	0.92	1.00	5.00
Wealth index	3125.00	3.05	1.44	1.00	5.00
Mother's age	3125.00	29.32	6.51	16.00	49.00
Mother's educational level	3125.00	1.73	0.57	0.00	3.00
Marital status	3125.00	1.25	0.94	0.00	5.00
Household water source	3125.00	23.26	10.90	11.00	96.00
Residence	3125.00	1.63	0.48	1.00	2.00

Source: Gamette et al., 2020