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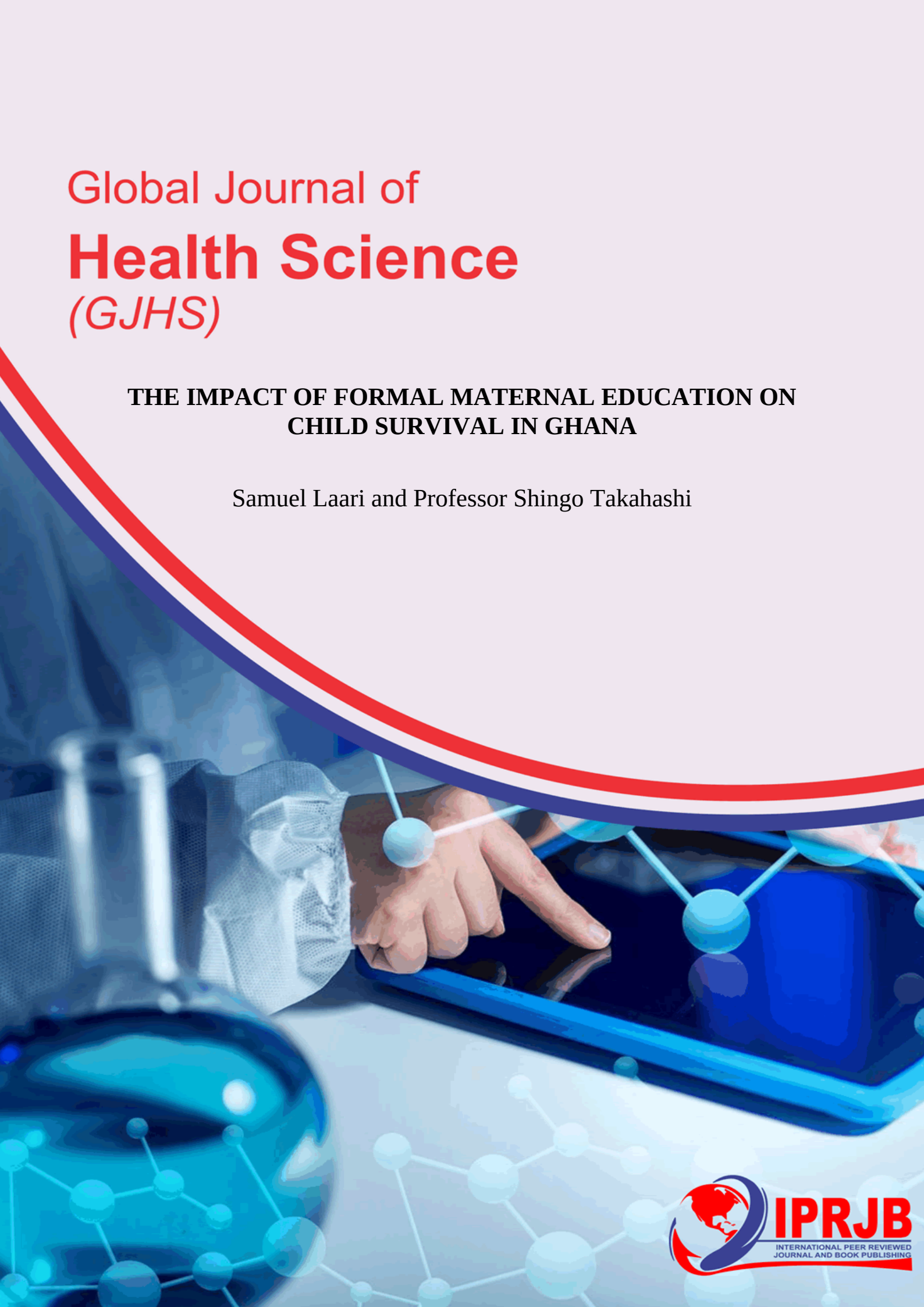

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THE IMPACT OF FORMAL MATERNAL EDUCATION ON CHILD SURVIVAL IN GHANA

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Abstract

Purpose: The purpose of this study is to investigated the impact of formal maternal education on child survival in Ghana using a probit model.

Methodology: This study used data from the Ghana Demographic and Health Survey for the period of 1993 to 2008. It is nationally representative sample including urban and rural areas in the 10 regions of Ghana. It looks at trends in demographic and health indicators and is conducted every five years (GSS, 2009). .

Findings: Mothers' education had a positive and significant effect on child survival. In 2003 the probability of a child surviving up to age five increased by 15.4 percentage points for one year increase in mothers' education, using control variables and 8.9 percentage points for a year increase in mothers' education, after including socio-economic and reproductive factors of women, which revealed the true partial effect of maternal education.

Unique contributions to theory practice and policy: It was observed that socio-economic and reproductive factors of women had an impact as well, hence policy makers should act to improve on these factors in order to complement the effect of formal maternal education to promote child survival in Ghana.

Keywords: *Child Survival, GDHS, Maternal Education, Mediate, Probit.*

INTRODUCTION

Formal maternal education is a measure of a mother's education level. This focuses on enhancing parenting practices and behaviors such as developing and prctising positive discipline techniques, learning age-appropriate child development skills and milestones, promoting positive play and interaction between parents and children and locating and accessing community services and support. This study investigates the relationship between formal maternal education and child survival in Ghana. In order to find out the effect of maternal education, it will include socio-economic and reproductive variables of the mothers, which are believed to mediate between maternal education and child survival. Raj et al. (2010) found that there was a high probability of an increase in nutritional problems of children whose mothers got married at a lesser age. Other factors such as the size of the child at birth, twin, the total number of children ever born and desire for pregnancy were found to affect child survival as well. Place of residence and distance in terms of access to health care facilities would also affect child survival.

Mothers with low level of education have high risk of loosing their children before they attain the age of five years. Similar studies on this topic in Ghana are scarce, however, some studies have found that mothers' years of schooling have a large impact on child survival directly or indirectly. Maternal education can affect child health in one or many ways such as nutrition. Aslam and Kingdon (2012), Cochrane et al. (1982), Frost et al. (2005), Kassauf and Senaur (1996).

Child health and childhood mortality are measures of development in the society (Zachary et al. 2013). That is why ensuring child survival is of great importance. MDG 4 was set to reduce under-five mortality two-thirds by the end of 2015 from its 2000 goals. Under-five mortality is decreasing across the globe and it was predicted to be around 7.2 million in 2011 (Lozano et al. 2011). About106 countries were predicted to reduce under-child mortality sharply by 2000-2010. However unforeseen challenges make it very difficult to attain these targets. These challenges would make many governments unable to attain MDG 4's main objectives by 2015 (Lozano et al. 2011).

According to the 2008 GDHS report, the under-five mortality rate was 80 deaths per 1,000 live births in the most recent five-year period, and the infant mortality rate was 50 deaths per 1,000 live births (GSS, 2009). Interagency Group for Child Mortality Estimation (IGME) led by the United Nations International Children's Emergency Fund (UNICEF) shows that child mortality rate in Ghana declined from 122 in 1990 to 74 per 1000 live births in 2010 with a yearly average rate of decline about 2.5. This rate was not significant for Ghana to attain MDG main objective of 40 per 1,000 live births by 2015 (IGME, 2011).

According to Mosley and Chen (1984), child survival is due to many reasons including the reproductive behavior of women. Caldwell and McDonald (1982) also showed that there was a great impact of maternal education on promoting child survival. Mothers' years of schooling were more important than other factors such as access to health care. Cochrane et al. (1982) also showed the relationship between parents' education and its effects on child health. Children of educated parents were more likely to survive.

In Pakistan, mothers' knowledge on health matters and her ability to take a decision in relation to domestic matters processed through which the educational level of mother's had a positive impact on the health of children. Aslam and Kingdon (2012). Formal education builds the capacities of women in decision-making with regards to domestic issues, which

would promote child survival. This indicates an indirect impact on mothers' educational level child health.

Therefore, the objective of this study is to determine the factors that affect child survival in Ghana over the period of 1993 to 2008, through formal maternal education and to identify the magnitude and significance effects and its relevance to Ghana.

THEORETICAL WORKS

This section delves into theories on related studies of this topic. First it looks at how various measures impact on child survival. It also looks at the direct or indirect impact maternal education has on child survival. Mosley and Chen (1984) looked at social and biological indicators that affect child survival. They categorized the determinants into maternal such as bio-demographic and other factors. The quality of air was considered environmental and many physical health factors such as medical treatment were the determinants of child survival. Cochrane et al. (1982) tested the impact maternal education had on the nutritional status of children by acquiring knowledge on preventive measures and how to earn income. Aslam and Kingdon (2012) and Frost et al. (2005) looked at socio-economic indicators, accessibility of information by mothers' participation in paid jobs and other indicators that mediate the impact of maternal education.

Key Factors that Mediate between Mothers Education and Child Survival

Marital status, household size, and reproductive behavioral factors were found by (Dejene and Girma 2013, Mekonnen 2011, Mekonnen et al. 2013); to be the bio-demographic and socioeconomic indicators that impacted on child survival.

Indicators such as the age of the mother and access to social amenities were found to have a positive impact on child survival by (Mulugeta 2012). Maternal education was the key component of child survival found by all of these studies. They looked at the direct partial impact of maternal education. This study looks at the partial impact of maternal education over the years; it's interrelation with other indicators that have either direct or indirect impact on child survival.

Factors such as electricity, public toilets, proper sanitary disposals and piped water were essential indicators that impacted positively on child survival by Adebayo and Fahrmeir (2005). The study also saw time as an essential indicator as well as the period of breastfeeding. It was revealed that mother's often involvement of job out of home adversely impacted on the probability of child survival. Mother's education and her decision-making ability in the household were the most effective indicators of child survival in Nepal according to Adhikaril and Sawangdee (2011).

Main factors whose roles are usually checked through maternal education and child health include socio-economic status, health knowledge, and attitude towards modern health care utilization, women autonomy and fertility (Aslam and Kingdon, 2012; Buor, 2003; Frost et al., 2005). Each of these categories can be represented by a group of indicators. For example, putting together indicators such as wealth, husband educational level, and husband occupation captures the socio-economic status of a household. Frost et al. (2005) showed that socio-economic status was the highest essential channel, which connects educational level of mothers and the nutritional status of children. Cleland and Van Ginnken (1988) stated that education is a key indicator of the socio-economic status of a household. Income, water, latrine facilities, housing, and similar indicators are economic merits related to education. These channels revealed almost half of the relationship between education and child survival.

Ikeako et al. (2006) in Nigeria, found a link between maternal education and paternal education. According to Barrett and Browne (1996) mothers who are educated had a higher understanding of information and matters of health education than women who are not educated. Education of mothers resulted in a huge difference in the utilization of the services provided by health facilities though they have the same level of accessibility to these services without discrimination in terms of educational level. Access to health care service is very much determined to some extent by educational level of mothers in some countries (Cleland and Van Ginneken 1988). Considering interrelations of mother's educational level and public health programs, Barrera (1990) suggested that educational level of mothers' impact on the health of children by means of efficiency and allocative effects. Behaviors and attitude towards healthcare activities, which directly impacts on child nutritional level, has a link with maternal educational level (Frost et al., 2005).

METHODOLOGY

This study used data from the Ghana Demographic and Health Surveys (GDHS) conducted in1993, 1998, 2003 and 2008 respectively. It is nationally representative sample including urban and rural areas in the 10 regions of Ghana. It looks at trends in demographic and health indicators and is conducted every five years (GSS, 2009).

Indicators such as socioeconomic, demographic, and behavioral features were observations relevant to this study. The dependent variable in this study is dichotomous, which denotes the survival of a child at age five or below in the five years preceding the 1993, 1998, 2003 and 2008 surveys respectively. Probit models were estimated to determine factors of child survival using data from each year and the pooled data set. The model is specified below:

$$Ci = \beta 0 + \beta 1X1 + \beta 2X2 + \ldots + \beta nXn + Ei, \quad (1)$$

Where;

Ci represents child alive at age five or below (1 if the child alive and 0 if not),

X1…,Xn are the independent variables (socioeconomic, biological, behavioral, and environmental factors),

β's are the coefficients that are estimated from the model, and E is the error term that represents the unobserved factors that would have an effect on child survival.

$$Ci = \beta 0 + \beta 1X + \beta 2Y + \beta nZ + Ei \quad (2)$$

Where;

Ci represents child alive at age five or below (1 if the child alive and 0 if not),

X represents control variables for geographical differences, sex of the child and age of the mother.

Y represents mother's education, and

Z represents explanatory variables that are likely to affect child survival, such as socioeconomic status together with reproductive behaviors of women. The relevance is on magnitude and significance of coefficients for maternal education at different specifications. The impact of Z would be the difference in the magnitude of the coefficient for maternal education from probit estimation without the Z and with Z. The change in the significance level of the two coefficients shows the impact of the relationship between maternal education and the Z variables.

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Table 1 Summary and Description of variables used for Analysis

Variable	Measure	Expected Effect
Child is live	Yes =1, No=0	
Mother education level	Schooling in years	+
Sex of child	Male=1, Female=0	+(-)
Mother body mass index (BMI)	BMI in numbers	+
Main floor material	Improved =1, Not improved=0	+
Has electricity	Yes=1, No=0	+
Husband has occupation	Yes=1, No=0	+
Wealth index	Poorest=1, Poorer=2, Middle=3, Richer=4, Richest=5	+
Husband education	In years	+
Mother working in a job	Working=1, not working= 0	+
Breastfeeding duration	0= below 6months, 1=above 6months	+
Who decides	1= mother with husband, only 0=husband	+
The child has Twin	multiple birth=0, Single birth=1	-
Birth order number (parity)	0=first to fourth, 1=fifth to eighth, 2=nine to thirteenth	?
Number of children ever born in numbers	0=first to three, 1=four to six, 2=seven and over	-
Desire	1= yes (then/later), 0=No more	+
Watches television every week	Yes=1, No=0	+
Reads newspaper once a week	Yes=1, No=0	+
Listens to radio weekly	Yes=1, No=0	+
Place of residence	Rural (=1), Urban (=0)	-
Delivery of place	0=Home, Hosp./Health facility	+
Household has television	Yes=1, No=0	+
Household has refrigerator	Yes=1, No=0	+
Household has radio	Yes=1, No=0	+
Antenatal visits for pregnancy	Yes=1, No=0	+
Size of child at birth	1= Larger than average, 2=Average 0=Smaller than average	+
Religion: it includes, No religion, Christian, Moslem and Traditional	The reference group is No religion	?
Region (Western is a reference group)	Central, Greater Accra, Volta, Eastern Ashanti, Brong-Ahafo, Northern, Upper West and Upper East	?
Period	0=1993, 1=1998, 2=2003, 3=2008	+

'+' Shows increase in probability of child survival,
'- ' Shows a decrease in a probability of child survival

FINDINGS

Descriptive Statistics

Sample Characteristics by Year

Means of the survival of children are compared across 1993,1998, 2003, and 2008 surveys respectively. The mean of under-five survival rate increased from 1993 to 2003. It was 18 % in 1993 and 27% in 1998, from1998 to 2003 it increased sharply to 69%. It, however, dropped from 2003 to 2008 to 24%. The mean of survival rate from the pooled data is 35%.

Table 2: Total Children sampled by year

Variable	Obs.	Mean.	Std. Dev.
1993	2204	.18	.38
1998	2204	.27	.44
2003	3298	.69	.46
2008	3844	.24	.43
Total	11550	.35	.03

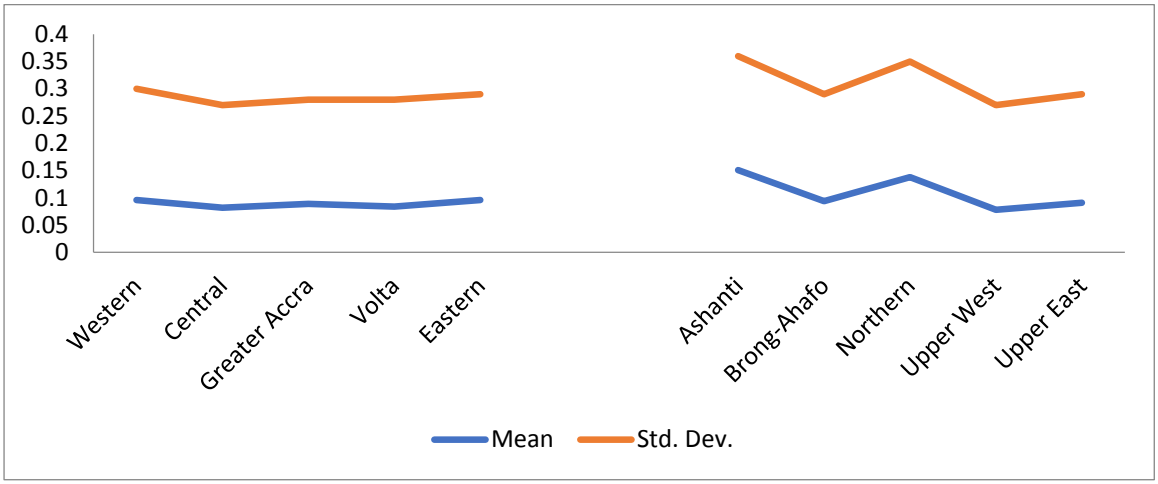
Table 3 shows an interesting fluctuating trend in the regional mean of the incidence of child survival. For example, Greater Accra region, which is the capital city, didnotshowchange in its child survival trend. In 1993, the total mean of incidence of survival of all regions was 10%. In terms of regional variations the mean of survival was very high in the Ashanti with 18% followed by the Northern region 12%, then Eastern and Volta regions also had 11% each. In 1998, the highest mean of survival was still the Ashanti region with 14% with the lowest being the BrongAhafo region with 7%.

In 2003, the highest mean for child survival was the Northern Region with 16% and lowest in the Central Region with 6%. In 2008 Northern region still had the highest mean of 16% and the Central, Volta and Upper West regions had the lowest of 8% each. Generally, there is an improvement of child Survival over the years.

Table 3: Summary of Child Survival by Region.

	1993		1998		2003		2008	
	Obs.	2204	Obs.	2204	Obs.	3298	Obs.	3844
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Western	0.09	0.29	0.11	0.31	0.09	0.29	0.09	0.29
Central	0.1	0.31	0.09	0.29	0.06	0.24	0.08	0.26
G. Accra	0.09	0.29	0.09	0.28	0.09	0.28	0.09	0.29
Volta	0.11	0.31	0.08	0.28	0.07	0.26	0.08	0.27
Eastern	0.11	0.31	0.11	0.32	0.08	0.27	0.09	0.28
Ashanti	0.18	0.39	0.14	0.34	0.15	0.36	0.15	0.35
B. Ahafo	0.1	0.29	0.07	0.25	0.12	0.32	0.09	0.28
Northern	0.12	0.32	0.11	0.31	0.16	0.37	0.16	0.37
Upper West	0.03	0.18	0.09	0.28	0.1	0.3	0.08	0.26
Upper East	0.07	0.25	0.12	0.32	0.08	0.26	0.1	0.3
Total	0.1	0.294	0.101	0.298	0.1	0.295	0.101	0.295

Figure 1: Regional Trend of Child Survival.



The regional trends of child survival show the Ashanti and the Northern regions with higher means while the other regions have almost same figures. This shows there is no much regional difference in terms of the distributions of the mean with regards to child survival.

RESULTS AND DISCUSSION

There are some variables missing in the data especially in 1993 and 1998. It could be due to the inclusion of some variables in the GDHS data over the years. Therefore, regressions on these two years and the pooled data set have missed some variables and the estimations may not be as efficient as the 2003 and 2008 regressions. Despite the missing variables, 1993, 1998 and the pooled dataset still have very important variables needed.

Socio-economic and reproductive behavioral factors such as husband education, wealth status, antenatal visits and others factors were included in the regression to observe their effect and by how much. The main variable of interest in this study is maternal education. The estimates in the regression showthat years of maternal education increase the probability of child survival. The magnitude of coefficients are fairly large and they are significant for 1993 and1998 at ($p<0.01$), 2003 and 2008 at ($p<0.05$) and also the pooled dataset at ($p<0.05$).

In 2003, the probability that a child will survive and live to see his or her fifth birthday increased by 15.4 percentage points for an additional year of schooling with mothers' education and control variables and 8.9 percentage points for an additional year of schooling after including socio-economic and reproductive behavioral factors of women.

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Table 5: Probit Estimates of Child Survival in Ghana from the Year 1993 to 2008.

VARIABLES	(1) 1993	(2) 1998	(3) 2003	(4) 2008	(5) Total
Mothers' Education in Years	0.0809*	0.0803*	0.0885**	0.0885**	0.0871**
	(0.0440)	(0.0443)	(0.0442)	(0.0442)	(0.0444)
Husbands' Education in Years	0.104**	0.107**	0.135***	0.135***	0.127**
(DEMOGRAPHIC)	(0.0487)	(0.0508)	(0.0507)	(0.0507)	(0.0512)
Age of Mother					
(Excluded 15-19)					
20-29	-0.134	-0.140	-0.141	-0.141	-0.141
	(0.0971)	(0.0972)	(0.0974)	(0.0974)	(0.0975)
30-39	-0.0864	-0.0957	-0.0887	-0.0887	-0.0898
	(0.105)	(0.106)	(0.106)	(0.106)	(0.106)
40-over	-0.114	-0.124	-0.112	-0.112	-0.113
	(0.121)	(0.121)	(0.122)	(0.122)	(0.122)
BMI	-1.79e-05	-1.88e-05	-1.77e-05	-1.77e-05	-1.80e-05
	(1.46e-05)	(1.47e-05)	(1.48e-05)	(1.48e-05)	(1.48e-05)
(GEOGRAPHICAL)					
Place of Residence					
(Excluded Rural)					
Urban	0.00630	0.00801	0.0551	0.0551	0.0568
	(0.0487)	(0.0546)	(0.0563)	(0.0563)	(0.0565)
Region					
(Excluded Western)					
Central	-0.0992	-0.0971	-0.0959	-0.0959	-0.0949
	(0.0818)	(0.0819)	(0.0820)	(0.0820)	(0.0820)
Greater Accra	0.0926	0.0897	0.102	0.102	0.0962
	(0.0906)	(0.0915)	(0.0917)	(0.0917)	(0.0921)
Volta	0.128	0.128	0.128	0.128	0.118
	(0.0882)	(0.0884)	(0.0883)	(0.0883)	(0.0886)
Eastern	0.0483	0.0556	0.0584	0.0584	0.0477
	(0.0830)	(0.0833)	(0.0829)	(0.0829)	(0.0834)
Ashanti	0.0730	0.0739	0.0796	0.0796	0.0760
	(0.0748)	(0.0750)	(0.0750)	(0.0750)	(0.0751)
B. Ahafo	0.0838	0.0814	0.0738	0.0738	0.0692
	(0.0826)	(0.0829)	(0.0828)	(0.0828)	(0.0830)
Northern	-0.0611	-0.0627	-0.0928	-0.0928	-0.0953
	(0.0777)	(0.0780)	(0.0774)	(0.0774)	(0.0789)
Upper West	0.0534	0.0489	0.00961	0.00961	0.0113
	(0.0871)	(0.0877)	(0.0884)	(0.0884)	(0.0889)
Upper East	0.101	0.0935	0.0731	0.0731	0.0746
	(0.0856)	(0.0862)	(0.0861)	(0.0861)	(0.0867)
SOCIO-ECONOMIC FACTORS					
Floor Material					
(Excluded Not improved)					
Improved	0.0347	0.0356	0.0219	0.0219	0.0222
	(0.0402)	(0.0405)	(0.0406)	(0.0406)	(0.0407)
Mother Working	0.0348	0.0333	0.0251	0.0251	0.0257
(Excluded No)	(0.0511)	(0.0511)	(0.0512)	(0.0512)	(0.0512)
Decision Taking					
(Excluded only Husband)					
Mother with Husband	0.579***	0.575***	0.577***	0.577***	0.578***
	(0.105)	(0.105)	(0.105)	(0.105)	(0.105)
Wealth Index					
(Excluded Poorest)					

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Poorer			-0.0682	-0.0682	-0.0747
			(0.0682)	(0.0682)	(0.0686)
Middle			-0.210***	-0.210***	-0.217***
			(0.0761)	(0.0761)	(0.0764)
Richer			-0.253***	-0.253***	-0.259***
			(0.0938)	(0.0938)	(0.0943)
Richest			-0.399***	-0.399***	-0.407***
			(0.119)	(0.119)	(0.120)
Has Television		-0.0279	0.0407	0.0407	0.0400
		(0.0686)	(0.0725)	(0.0725)	(0.0726)
Has Refrigerator		0.0818	0.129	0.129	0.128
		(0.0802)	(0.0867)	(0.0867)	(0.0868)
Has Radio		0.0217	0.0281	0.0281	0.0278
		(0.0393)	(0.0398)	(0.0398)	(0.0398)
Has Electricity		-0.00676	0.0401	0.0401	0.0430
		(0.0564)	(0.0583)	(0.0583)	(0.0585)
Watches TV		-0.0347	-0.0724	-0.0724	-0.0750
		(0.0493)	(0.0504)	(0.0504)	(0.0505)
Reads News Paper		-0.0519	-0.0767	-0.0767	-0.0764
		(0.0861)	(0.0863)	(0.0863)	(0.0863)
Listens to Radio		-0.0203	-0.0344	-0.0344	-0.0322
		(0.0562)	(0.0563)	(0.0563)	(0.0563)
REPRODUCTIVE BEHAVIOR FACTORS					
Breastfeeding Duration					
Excluded less than 6mothns)					
6mothns and over	0.433***	0.433***	0.432***	0.432***	0.433***
	(0.0376)	(0.0376)	(0.0376)	(0.0376)	(0.0377)
Place of Delivery					
(Excluded Home)					
Hospital	0.0245	0.0230	0.0314	0.0314	0.0315
	(0.0427)	(0.0431)	(0.0431)	(0.0431)	(0.0432)
Size of Child at Birth					
(Excluded Smaller than Average)					
Average	0.279***	0.280***	0.279***	0.279***	0.280***
	(0.0500)	(0.0500)	(0.0501)	(0.0501)	(0.0501)
Larger than Average	0.220***	0.220***	0.218***	0.218***	0.219***
	(0.0477)	(0.0477)	(0.0477)	(0.0477)	(0.0478)
Desire	-0.125**	-0.127**	-0.131**	-0.131**	-0.128**
	(0.0579)	(0.0580)	(0.0581)	(0.0581)	(0.0581)
Antenatal Visits	-0.0273	-0.0229	-0.0356	-0.0356	-0.0349
	(0.0664)	(0.0668)	(0.0669)	(0.0669)	(0.0670)
Sex of Child					
(Excluded Female)					
Male	-0.0580	-0.0575	-0.0590*	-0.0590*	-0.0587*
	(0.0355)	(0.0355)	(0.0356)	(0.0356)	(0.0356)
Twin					
(Excluded Multiple Birth)					
Single Birth	0.619***	0.618***	0.620***	0.620***	0.619***
	(0.0695)	(0.0696)	(0.0696)	(0.0696)	(0.0697)
Birth Order Number					
(Excluded 1-4)					
5-8	0.200***	0.199***	0.196***	0.196***	0.196***
	(0.0627)	(0.0628)	(0.0629)	(0.0629)	(0.0629)
9-13	0.273**	0.272**	0.265**	0.265**	0.266**
	(0.122)	(0.122)	(0.122)	(0.122)	(0.122)
Number of Children Ever Born					
(Excluded 1-3)					
4-6	-0.214***	-0.212***	-0.216***	-0.216***	-0.216***
	(0.0533)	(0.0535)	(0.0535)	(0.0535)	(0.0535)
7 and over	-0.500***	-0.496***	-0.506***	-0.506***	-0.505***
	(0.0888)	(0.0890)	(0.0892)	(0.0892)	(0.0892)
Period (Excluded 1993)					
1998	-0.253***	-0.261***	-0.277***	-0.277***	-0.264***
	(0.0655)	(0.0707)	(0.0656)	(0.0656)	(0.0706)

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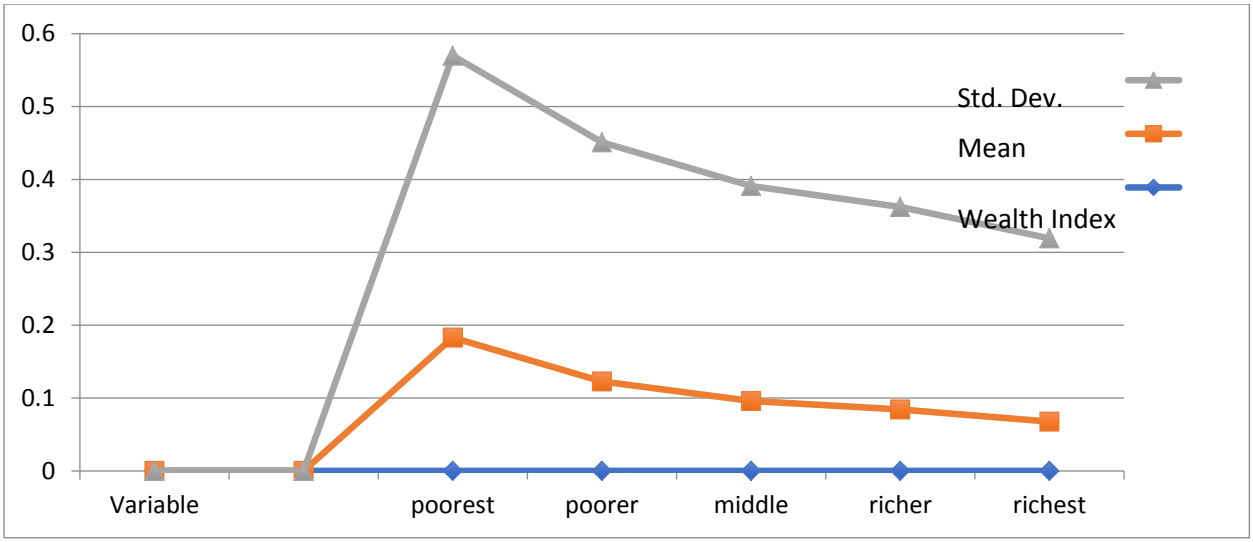
2003	0.254***	0.272***	0.173**	0.173**	0.166**
	(0.0657)	(0.0687)	(0.0734)	(0.0734)	(0.0771)
2008	-0.167**	-0.190***	-0.116	-0.116	-0.105
	(0.0677)	(0.0727)	(0.0757)	(0.0757)	(0.0796)
Religion (Excluded No Religion)					
Christian	0.000582	0.00213			0.00565
	(0.0499)	(0.0500)			(0.0501)
Muslim	0.0934	0.0939			0.106
	(0.0796)	(0.0798)			(0.0802)
Traditional	0.0152	0.0125			0.0318
	(0.0539)	(0.0539)			(0.0544)
Constant	0.644***	0.647***	0.772***	0.772***	0.760***
	(0.164)	(0.165)	(0.168)	(0.168)	(0.170)
Observations		2204	2204	3298	3844	11550
P>Chi Square	0000		0000	0000	0000	0000

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

-This regression included the socio economic and behavioral factors mentioned in this study together with the control variables

-The regression with mothers' education and only control variables are in Appendix

Figure: 2 Child Survival Trend using Wealth Index1



This figure shows clearly that children from poorest families are most likely not to survive across the years with huge means and very wide standard deviations followed by those in poorer homes with similar trends in the distribution. However, children from the middle, richer and richest families have a higher chance of surviving with smaller means and narrow standard deviations. This trend is also observed in the two regressions in this study.

1 From pooled data set 1993 to 2008 GDHS.

This study is interested in observing whether there would a change on the impact of maternal education on child survival by using mothers' years of schooling and control variables only in the first regression and then the inclusion of socio-economic variables, which are considered to mediate the effects of maternal education in the second regression. It can then be interpreted that the change in significance and magnitude of the coefficient is due to the inclusion of the socio-economic variables.

An observation from the regressions shows that maternal years of education has a positive and significant effect on child survival over time except that the impact was reduced when socio-economic variables (channels) that mediate between mother's education and child survival were introduced in the second regression in table 5. Regression table 4 in appendix 1 is estimated with only mothers' education in years with control variables without the socio-economic variables.

The coefficients in regression table 4 in appendixes 1, shows both direct and indirect effects representing the total effect of maternal education. In regression table 5 socio-economic and reproductive behavior variables were introduced and the coefficient of maternal education decreased as well as its level of significance across the years from 5% to 10%, 1% to 10%, 1% to 5% and 1% to 5% in years 1993, 1998, 2003 and 2008 respectively while in the pool data set the significance did not change, however, the magnitude changed. The difference in the coefficients that mediated the impact of maternal education through socio-economic factors across the years including the pooled data set is the sum of all the coefficients in years of schooling of mother across the period in the first regression with only mothers' education and the control variables that is (0.104 + 0.104 + 0.154 + 0.112 + 0.104 = 0.578)minus the sum ofthe corresponding coefficients in the second regression which includes the socio-economic variables (0.0809 + 0.0803 + 0.0885 + 0.0885 + 0.0871 = 0.4253) and then divide it by the initial sum of coefficients of maternal schooling in years with control variables in the first regression. That is (0.578-0.4253)/(0.578)*100 = 26.4%. This indicates that the true partial effect of maternal education is realized after subtracting 26.4% ofthe socio-economic effects. This is a possible confirmation of findings by Frost et al (2005), which showed that socio-economic indicators were the key factors that connect educational level of mothers' and the nutritional status of children.

This study also revealed that the total impact of formal maternal education is fairly the same with time. The significance of maternal education and its coefficients in both regressions increased over the periods. Hence, this study can state that increasing maternal education is an important indicator in promoting child survival.Another important revelation is the role socio-economic factors and reproductive behaviors of women had on mothers' years of schooling across the period. An important factor considered was husbands' educational attainment and wealth status, which was found to be significant across the years. Educated and wealthy men were found to be the choice of literate women when it comes to marriage. Ikeako et al. (2006), in Nigeria, there was a link between maternal years of schooling and parents education. These mothers have higher opportunity of getting a well-paid work.

Mother'sdecision together with husband was found to be significant at 1% across the years of survey confirming Adhikaril and Sawangdee (2011) study, that mother's education and her decision-making ability in the household were the most effective indicators of child survival in Nepal.The breastfeedingperiod of 6months or more was seen to be significant at 1% confirming the findings of Adebayo and Fahrmeir (2005) that breastfeeding was an essential indicator of child survival. It also found that the number of children ever born by a mother had influence on child survival.

Mothers with 4 or more children were significant compared to those with 3 or less children and this could be due to the experience they have gained over the years raising children. Hence the experience level of mothers concerning childbirth and care contributes significantly to child survival.Single birth children were found to be significant compared to twin children. Size of child at birth is significant when average or larger than average relative to smaller than average.Birth order is also found to be significant at five or more as compared to four or less. The desire for the child or pregnancy was found to be significant relative to no desire.

Male child was significant only in 2003 and 2008 at 10% each but with negative effect on child survival. All these indicators discussed are either socio economic or reproductive behavioral factors as indicated earlier.

Therefore, these results implies that acting on factors that can improve socio-economic status and reproductive behaviors of women would complement positively with increasing maternal education to promote child survival. This reveals that better socio-economic factors can equally take the place of formal maternal education to improve child survival greatly. This could be a viable alternative since formal maternal schooling takes some longer period.

CONCLUSION AND POLICY RECOMMENDATION

The health of children is an issue that should not be treated lightly; hence this study seeks to contribute to knowledge on factors determining the welfare and survival of children through investigating the impact of mothers' years of schooling on child survival. The study showed that maternal education has both direct and indirect effects on child health status.

The objective of the study was to determine the factors that affect child survival in Ghana over the period of 1993 to 2008, and the data was obtained from the Ghana Demographic and Health Survey (GDHS). Including a group of socio-economic and reproductive behavioral factors in the regression determined the partial effect of maternal education on child survival.

These factors were tested to see the impact of their mediation between maternal years of schooling on child survival. A change in the impact of maternal years of schooling was observed across the period and hence confirmed the presence of mediation by socio-economic and behavioral factors.

The total effect of the socio-economic and reproductive behavioral factors was 26.4%. In 2003 the chance that a child would survive up to age five increased by 15.4percentage points for one additional year of schooling together with control variables and 8.9 percentage points for one additional year of schooling after including socio-economic and reproductive behavioral factors of women.

This study also showed that taking action on factors that can improve socio-economic status, and reproductive behaviors of women would promote more positive effect on increasing maternal education, implying that when socio-economic factors are improved it can equally take the place of formal maternal education to promote child survival largely. These alternatives can equally yield good results especially for the fact that formal maternal schooling takes some longer period to be attained.

Though Ghana has made significant gains, a lot more needs to be done to achieve the target of 40 deaths per 1,000 live births or better since the target year of 2015 has passed. Child survival in Ghana needs continuous attention despite the gains and should be one of the major public health concerns in the country.

Therefore, policy makers should be considering pragmatic measures that would enhance the socio-economic and reproductive behavioral capacities of women in order to complement its effect with formal maternal education to promote child survival since maternal years of schooling takes a long time.

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REFERENCES

Adebayo, S. B. and L. Fahrmeir (2005). Analysing Child Mortality in Nigeria with Geo-additive Discrete Time Survival Models. Statistics in Medicine, 24(5): 709-728.

Aderinwale, E.O. (2013). Challenges of Reducing Under-Five Mortality: An Analysis of Contributing Factors from the Nigerian context.A Research Paper in partial fulfillment of the requirements for obtaining the degree of Master of Arts in Economics of Development. International Institute of Social Studies (ISS), The Hague.

Adhikari, R. and Y. Sawangdee, (2011). Influence of Women's Autonomy on Infant Mortality in Nepal.Reproductive Health, 8(7): 1-8.

Andoh, S. Y. M. Umezaki, K. Nakamura, M. Kizuki, and T. Takano (2007). Association of House-hold Demographic Variables with Child Mortality in Cote d'Ivoire.Journal Biosocial Science, 39(2): 257.

Aslam, M. and G., G. Kingdon (2012). Parental Education and Child Health: Understanding the Pathways of Impact in Pakistan. World Development, 40(10): 2014-2032.

Barrera, A. (1990). The Role of Maternal Schooling and its Interaction with Public Health Programs in Child Health Production, Journal of Development Economics, 32: 69–91.

Barrett, H. and A. Browne (1996). Health, Hygiene and Maternal Education: Evidence from the Gambia. Social Science & Medicine, 43(11): 1579-1590.

Bicego, G. T. and J. T. Boerma (1993). Maternal Education and Child Survival: AComparative Study of Survey Data from 17 Countries.Social Science and Medicine.36 (9): 1207-1227.

Bilal, N. (2012).Health Extension Program: An Innovative Solutions to Public Health Challenges of Ethiopia: A Case Study, Health Systems. 20/20, USAID.

Buor, D. (2003). Mothers' Education and Childhood Mortality in Ghana, Health policy,64(3): 297-309.

Caldwell, J. and P. McDonald (1982). Influence of Maternal Education on Infant and Child Mortality: Levels and Causes, Health Policy and Education. 2(3): 251-267.

Chen, Y. and H. Li (2009). Mother's Education and Child Health: Is There a Nurturing Effect? Journal of Health Economics, 28(2): 413-426.

Christiaensen, L. and H. Alderman (2004). Child Malnutrition in Ethiopia: Can Maternal Knowledge Augment the Role of Income? Economic Development and Cultural Change 52(2): 287-312.

Cleland J. C. and J. Van Ginneken (1988). Maternal Education and Child Survival in Developing Countries: The Search for Pathways of Influence, Social Science and Medicine. 27(12): 1357-1368.

Cochrane, S. H., J. Leslie, and D. J. O'Hara (1982) 'Parental Education and Child Health: Intra-country Evidence. Health policy and education.2(3): 213-250.

Desai, S., and S., Alva (1998). Maternal Education and Child Health: Is there a Strong Causal Rela-tionship? Demography. 35(1): 71-81.

Dejene, T. and E. Girma (2013). Social Determinants of Under-Five Mortality in Ethiopia: Event History Analysis Using Evidence from Ethiopian Demographic and Health Survey (EDHS)', Health, 5(5):(1949-4998).

Frost, M. B. R. Forste, and D. W. Haas (2005). Maternal Education and Child Nutritional Status in Bolivia: Finding the Links. Social Science & Medicine, 60(2): 395-407.

Ghana Statistical Service GSS, Ghana Health Service (GHS) and Macro International Inc. (2009).Ghana Demographic and Health Survey 2008. Accra, Ghana: GSS, GHS and Macro International Inc.

Handa, S. (1999). Maternal Education and Child Height', Economic Development and Cultural Change, 47(2): 421-439.

Ikeako, L., C., H., E. Onah, and G., C., Iloabachie (2006). Influence of Formal Maternal Education on The Use of Maternity Services in Enugu, Nigeria.Journal of Obstetrics & Gynecology.26(1): 30-34.

IGME (2011). Levels and Trends in Child Mortality, Retrieve on March 13, 2016 from http://www.childmortality.org/

Kassouf, A. L. and B. Senauer (1996). Direct and Indirect Effects of Parental Education on Malnutrition among Children in Brazil: A Full Income Approach. Economic Development and Cultural Change. 817-838.

Lozano, R., H. Wang, K. J. Foreman, J. K. Rajaratnam, M. Naghavi, J. R. Marcus, and C. J. Murray (2011). Progress towards Millennium Development Goals 4 And 5 on Maternal and Child Mortality: An Updated Systematic Analysis. The Lancet. 378(9797): 1139-1165.

Macassa, G., G. Ghilagaber, E. Bernhardt, F. Diderichsen, and B. Burström (2003). Inequalities in Child Mortality in Mozambique: Differentials by Parental Socio-Economic Position', Social sci-ence& medicine. 57(12): 2255-2264.

Mekonnen, D. (2011). Infant and child mortality in Ethiopia: the Role of Socio economic, Demographic and Biological Factors in the previous five years period of 2000 and 2005. MSc Thesis. Department of Economic History, Master Program in Economic Demography, Lund University.

Mekonnen, Y., B. Tensou, , D. S. Telake, T. Degefie, and A. Bekele (2013) 'Neonatal Mortality in Ethiopia: Trends and Determinants. BMC Public Health 13(1): 483.

Mosley, W. H. and L. C. Chen (1984). An Analytical Framework for the Study of Child Survival in Developing Countries.Population and Development Review.25-45.

Mulugeta, F. Z. (2012). Socioeconomic Factors Affecting Childhood Mortality In Ethiopia: An Instrumental Variable Approach', Ethiopian Journal of Economics. XX (2): 63-81.

Raj A., N. Saggurti, M. Winter, A. Labonte, M. R. Decker, and D..Balaiah, J. G. Silverman (2010). The Effect of Maternal Child Marriage on Morbidity and Mortality of Children under five in India: Cross Sectional Study of a Nationally Representative Sample. BMJ. 340:b4258.

Van der Klaauw, B. and L. Wang (2011). Child mortality in rural India.Journal of Population Economics.24:601–628.

Zachary, B., Z. Moore and P. Govindasamy (2013). Trends in Demographic and Reproductive Health Indicators in Ethiopia Data from the 2000, 2005, and 2011 Demographic and Health Surveys.ICF International Inc. Calverton, Maryland USA.

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Appendix

Appendix I

Table: 4 Probit Estimates of Child Survival in Ghana from 1993 to 2008 with only Control Variables

VARIABLES	(1) 1993	(2) 1998	(3) 2003	(4) 2008	(5) Total
Mothers' Education in Years	0.104**	0.104**	0.154***	0.112***	0.104**
	(0.0412)	(0.0412)	(0.0352)	(0.0408)	(0.0412)
DEMOGRAPHIC					
Age of Mother					
(Excluded 15-19)					
20-29	-0.0787	-0.0787	-0.0780	-0.0854	-0.0787
	(0.0936)	(0.0936)	(0.0930)	(0.0935)	(0.0936)
30-39	-0.127	-0.127	-0.130	-0.134	-0.127
	(0.0943)	(0.0943)	(0.0935)	(0.0941)	(0.0943)
40 and over	-0.164	-0.164	-0.166	-0.173*	-0.164
	(0.102)	(0.102)	(0.101)	(0.102)	(0.102)
BMI	-1.89e-05	-1.89e-05	-1.88e-05	-1.85e-05	-1.89e-05
	(1.41e-05)	(1.41e-05)	(1.41e-05)	(1.41e-05)	(1.41e-05)
GEOGRAPHIC					
(Excluded Rural)					
Urban	0.0551	0.0551	0.0802**	0.0544	0.0551
	(0.0437)	(0.0437)	(0.0408)	(0.0437)	(0.0437)
Region					
(Excluded Western)					
Central	-0.0865	-0.0865		-0.0889	-0.0865
	(0.0785)	(0.0785)		(0.0785)	(0.0785)
Greater Accra	0.152*	0.152*		0.153*	0.152*
	(0.0866)	(0.0866)		(0.0863)	(0.0866)
Volta	0.167**	0.167**		0.175**	0.167**
	(0.0845)	(0.0845)		(0.0842)	(0.0845)
Eastern	0.0862	0.0862		0.0913	0.0862
	(0.0796)	(0.0796)		(0.0792)	(0.0796)
Ashanti	0.0987	0.0987		0.101	0.0987
	(0.0717)	(0.0717)		(0.0716)	(0.0717)
B. Ahafo	0.0640	0.0640		0.0679	0.0640
	(0.0789)	(0.0789)		(0.0788)	(0.0789)
Northern	-0.0693	-0.0693		-0.0818	-0.0693
	(0.0738)	(0.0738)		(0.0723)	(0.0738)
Upper West	0.0104	0.0104		0.000892	0.0104
	(0.0828)	(0.0828)		(0.0822)	(0.0828)
Upper East	0.0713	0.0713		0.0598	0.0713
	(0.0809)	(0.0809)		(0.0802)	(0.0809)
Christian	0.0573	0.0573			0.0573
	(0.0438)	(0.0438)			(0.0438)
Muslim	0.126*	0.126*			0.126*
	(0.0739)	(0.0739)			(0.0739)
Traditional	0.0362	0.0362			0.0362
	(0.0477)	(0.0477)			(0.0477)
Constant	1.462***	1.462***	1.502***	1.498***	1.462***
	(0.114)	(0.114)	(0.0963)	(0.111)	(0.114)
Observations	2204	2204	3298	3844	11550
P>Chi Square	0000	0000	0000	0000	0000

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

-Regression with maternal years of schooling and control variables without the socio economic and behavioral factors mentioned in this study.